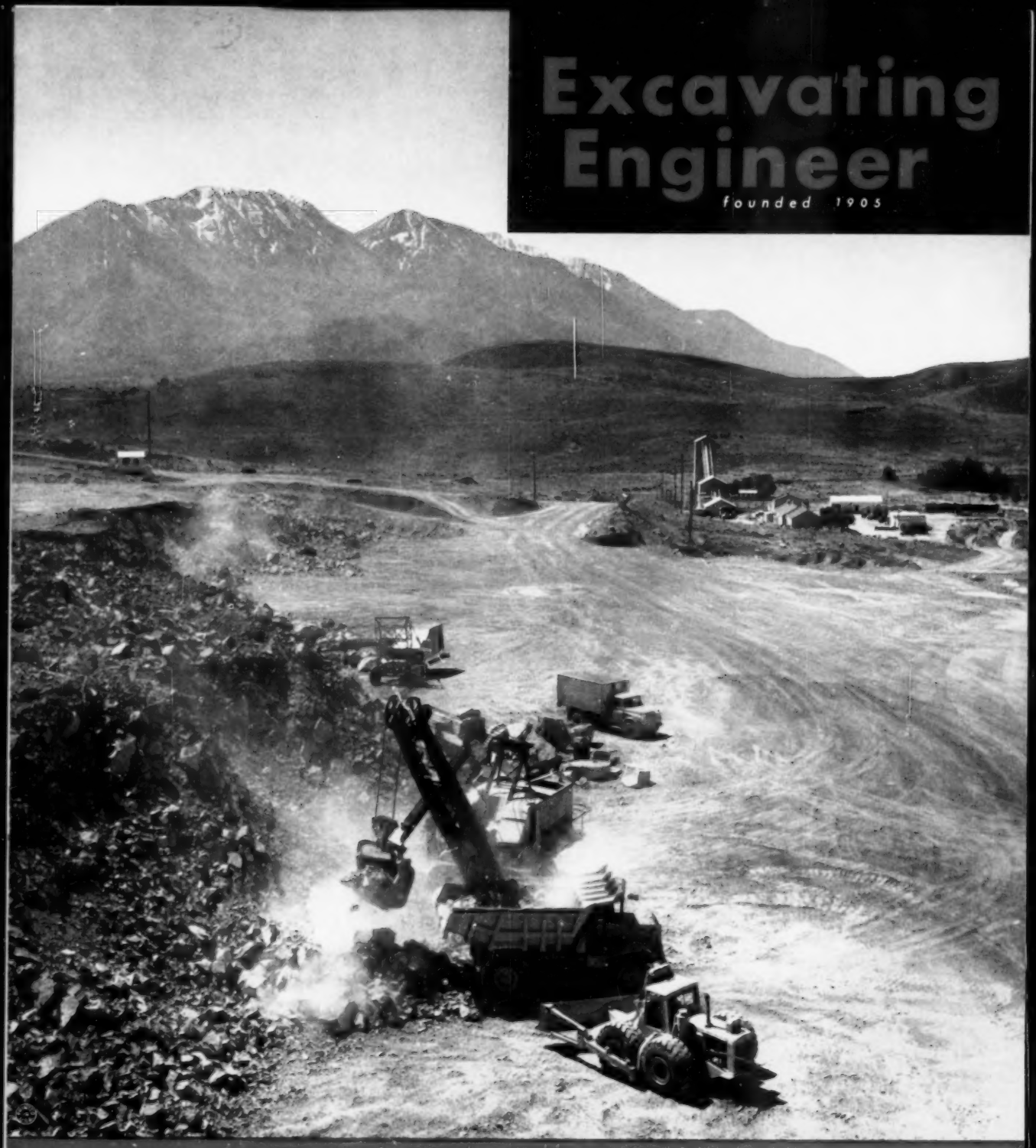
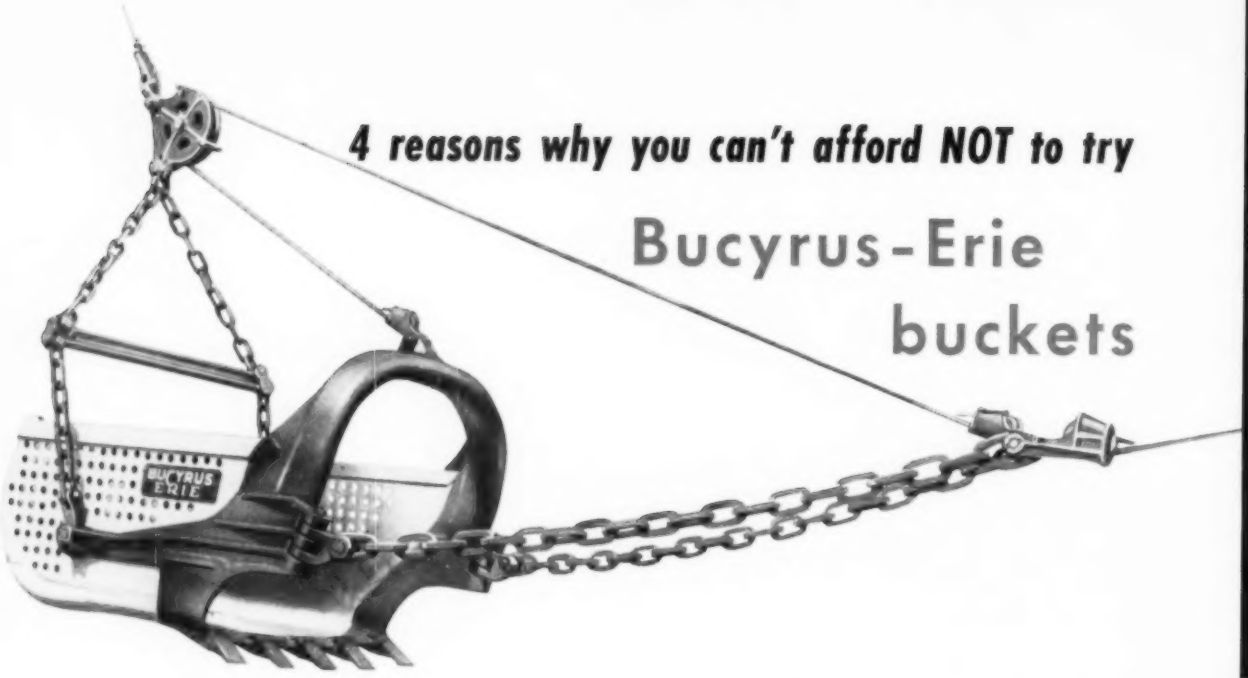
Excavating Engineer

founded 1905



Looking across the floor of United States Steel's Keigley quarry, near Payson, Utah, the camera sees a 3-yd. shovel loading an end-dump as a rubber-tire dozer waits to clean up the pit floor. An article begins on page 14.

JANUARY 1959



4 reasons why you can't afford NOT to try

Bucyrus-Erie buckets

1. THEY *DIG!* . . . smack home hard in rock and hardpan, slice fast through dirt and clay. Teeth and lip are angled to penetrate fast and deep . . . handle easy on trimming.

2. STEADY ON THE SWING, Bucyrus-Erie buckets have excellent balance with proper flaring . . . cut down on bobbing and spilling to hold the load throughout the swing.

3. HIGH-ARCH Bucyrus-Erie buckets dump fast and clean. Inside flair, which lets you fill the bucket with less inhaul, gets rid of the load fast and clean.

4. BECOLOY MAKES THE BUCKETS TOUGH . . . it's a special alloy developed by Bucyrus-Erie for greater strength with less weight. It has a tough, fibrous structure with amazing strength, is used where you need it most . . . in teeth, lip, arch, and clevis plates.

Bucyrus-Erie buckets are available for light, medium, or heavy-duty service, solid or perforated. See your distributor today for the right size, price, and delivery. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

47R58C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

Northwestern Engineering Company, Denver, Colorado, uses its Bucyrus-Erie 2-yd. BM bucket on relocation of Colorado Highway 65.

These engine users profit

from Allis-Chalmers economy of operation...

"Performing perfectly . . . no maintenance"

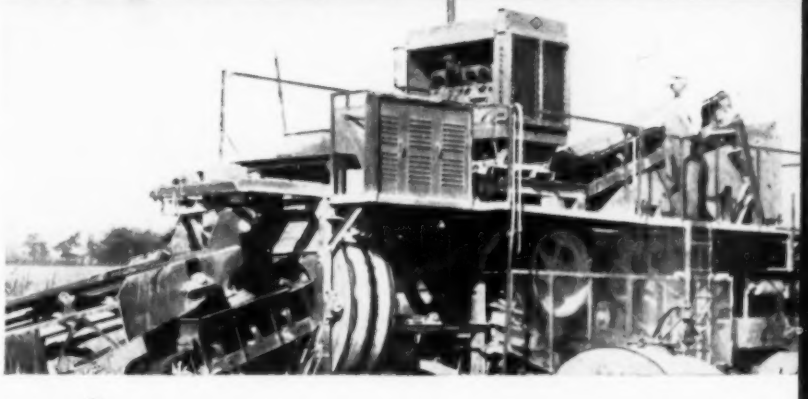
This 3-yd shovel, powered by an Allis-Chalmers supercharged diesel with torque converter, is working in tough digging, removing shot rock on an interstate highway. The engine uses only 10 gal. of fuel per hour, "is performing perfectly . . . no maintenance of any kind has been required," says the owner.

Helps hold down cost of moving overburden

Performance of big, tough, Allis-Chalmers supercharged diesels in these 55-ton trucks, has helped hold hauling costs down to a surprisingly low level.

"Like it best of any engine we've had"

"Wish we had one on the shovel," says the job superintendent about the Allis-Chalmers 180-hp diesel powering this crusher. The owner of another of these engines reports, "It's the cheapest of all to operate!"



...you can, too!

Allis-Chalmers engines give you maximum work per operating dollar. Design simplicity means easier servicing, too. Allis-Chalmers engines are always on the job because you are close to fast parts and service, wherever you are. See your dealer for full information on these engines that save you money — up to 516 hp—any application. Allis-Chalmers, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

POWER **FOR A GROWING WORLD**

A-C

8C-19A

No area above the **Diamond**foot comes in contact with the soil to alter psi rating; further, rolling drag and material pick-up are minimized.

The leading and trailing edges of the **Diamond**foot make easy foot penetration and withdrawal in heavy soils.

Cross-section dimensions of the **Diamond**foot are greater than any cross-section dimensions of the tapered shank. Full compaction effort is always exerted at the foot face and not dissipated through shank contact.

New **BROS** relief shank tamping foot provides full compaction effort and less drag

● Stress-relieved shank of the new BROS Diamondfoot design has two major advantages for earthwork compaction. Here's why:

First; to produce the lbs. per sq. in. foot pressure required by subgrade sheepsfoot rolling specifications, the BROS design permits the *full* compaction force of the roller drum to be exerted at the *bottom* of the foot —and not dissipated by shank contact with the soil materials. **That's because the Diamondfoot has a larger cross-section than any cross-section of the reverse tapering *shank*.**

Second; this design minimizes rolling drag because in penetration and withdrawal, the Diamondfoot edge design provides the least disturbance to the soil. Too, by reverse tapering, the shank is load relieved and the heavy soil materials have little chance to cling.

Other important features of this engineered Diamondfoot Roller include: Unitized drum and axle; non-adjusting, sealed, self-aligning ball bearings, *outside mounted*. Adjustable and reversible cleaner teeth provide extra long service life.

BROS Diamondfoot Rollers range in sizes from 133 psi to 724 psi foot pressures. Your nearest BROS Dealer has all the details. Or write us. Worldwide sales and service.

BROS

BROS *Incorporated*

ROAD MACHINERY DIVISION

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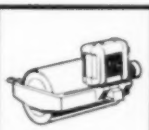
Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!

SHEEPSFOOT TAMPERS

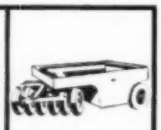
ROLL-O-PACTOR

BITUMINOUS CIRCULATOR



VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER



9 AND 13-TON ROLLERS

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Excavating Engineer

founded 1905

South Milwaukee, Wisconsin

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Here's why 22-B Transit Cranes

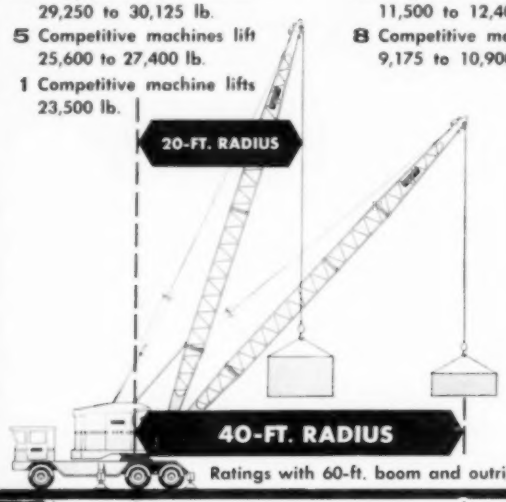
At 20 to 40-ft. radii, where you do the most work with a truck crane, the 22-B handles *bigger* payloads! Look at this comparison:

AT 20 FEET, 22-B LIFTS 33,000 LB.

- **4** Competitive machines lift 29,250 to 30,125 lb.
- **5** Competitive machines lift 25,600 to 27,400 lb.
- **1** Competitive machine lifts 23,500 lb.

AT 40 FEET, 22-B LIFTS 13,000 LB.

- **2** Competitive machines lift 11,500 to 12,400 lb.
- **8** Competitive machines lift 9,175 to 10,900 lb.



Ratings with 60-ft. boom and outriggers set.

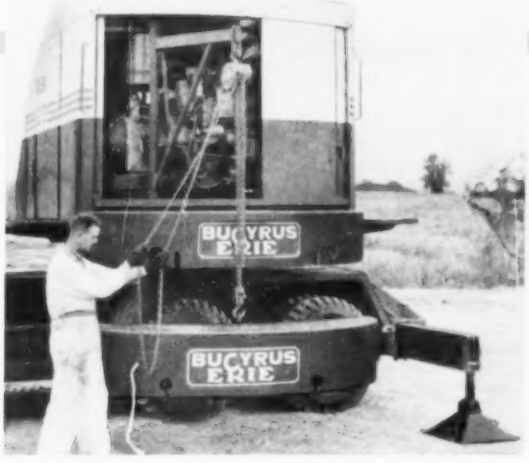
This is where MOST WORK IS DONE!

☆ **There's unusual stability** in the 22-B's wider spread outriggers. On the job, owners pull beams out to full 15-ft. spread, block them up — they're ready to work.

See your BUCYRUS ERIE® Distributor.

are YOUR BEST BUY!

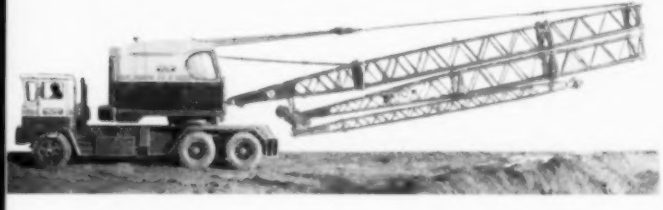
Compare the capacities, compare the features!



WITH THE 22-B YOU GET

Unmatched load control!

- Power-Controlled Lowering Boom Hoist
- Power-Controlled Load Lowering (hoist line)
- Friction Swing Brake
- Conical Hook Rollers

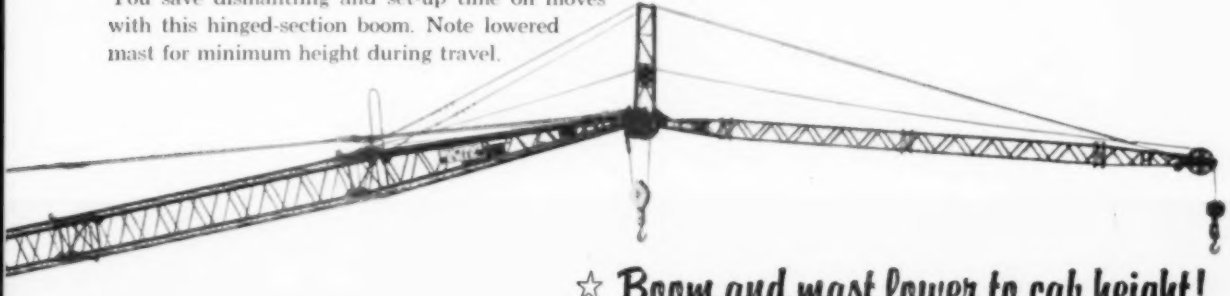


☆ Strips fast for travel!

Counterweight drops fast! Lowering time is cut to minutes by this special jib crane. System is manually operated, lets you drop counterweight to ground or low-boy trailer.

☆ Folding booms cut move time!

You save dismantling and set-up time on moves with this hinged-section boom. Note lowered mast for minimum height during travel.



☆ Boom and mast lower to cab height!

Booms up to 75 feet with or without mast can be lowered to cab height for traveling, *without* dismantling. 22-B picks up to 130 feet of boom and jib from ground without outside assistance!

☆ High alloy steel booms

are 50% stronger than ordinary structural steel booms, yet lighter in weight. Owners lift more PAYload . . . less DEADload!

He will show you a 22-B in action!

BUCYRUS ERIE®

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

Makes 230′ lifts using new tubular frame boom

WHIPPING, LAGS AND BACKLASH ELIMINATED...MORE LIVE LOAD CAPACITY—LESS DEADWEIGHT

A new type of crane boom — mounted on a Manitowoc 60-ton Model 3900 crane — is doing a spectacular job for the John F. Beasley Construction Company, setting steel at heights up to 230′. The job involves all the steel work for a new bridge to carry U. S. Highway 212 over the Missouri River between La Plant and Gettysburg, South Dakota. ▪ Constructed of high-strength tubular steel, the new boom is considerably lighter in weight than conventional booms. Although 200′ long, (without 30′ jib) it weighs 25% less than standard booms as short as 150′. Therefore, it can handle substantially greater live loads because of less deadweight of its own to support. ▪ Operator O. K. Bean reports: "I never have trouble with boom whipping now, even when carrying heavy loads high up... and I can boom out further without danger of overloading the crane. We can still locate the 'iron' exactly on the bolt hole the first time... with no lags or backlash." ▪ For specialized jobs like this or everyday jobs, you can depend on outstanding crane or excavator service from Manitowoc — check with your distributor soon!

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(A subsidiary of The Manitowoc Company, Inc.)
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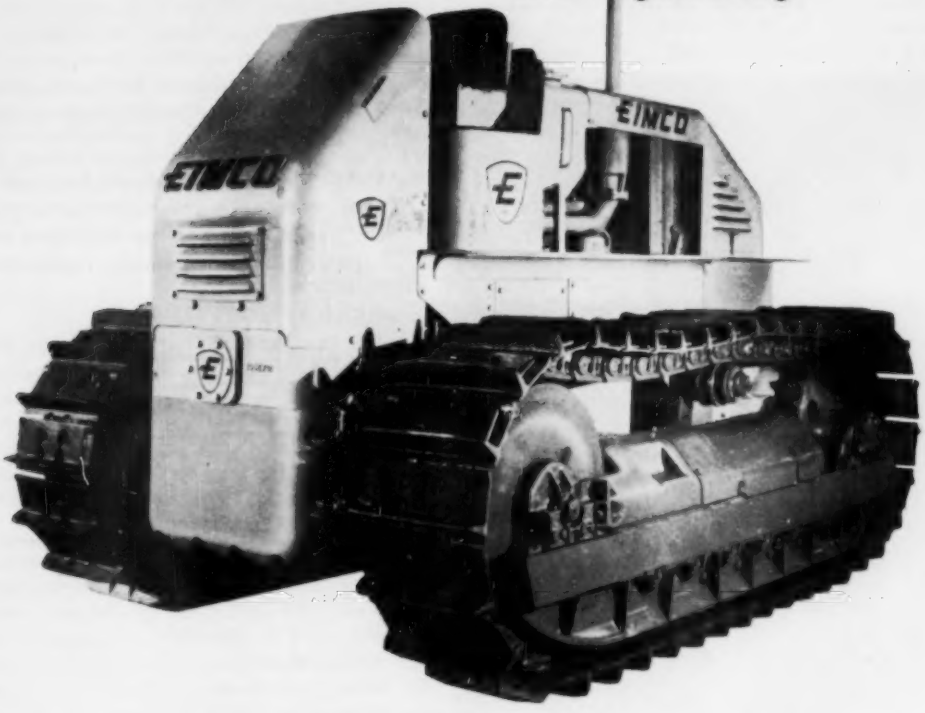

The EIMCO 105 TRACTOR introduces a new concept in rugged, efficient and practical tractor design and engineering.

Look at these Eimco features:

- Up - front operator position for unequalled visibility
- Torque - Converter transmission perfectly matched to engine
- Independent Track Drive for spin turns in own length
- Center - mounted power unit for better traction and balance
- Track Oscillation for easy operating mobility on all surfaces
- One piece cast alloy-steel track rollers, liquid flame hardened
- Instant reversal with one control lever for each track
- Many others we'll be glad to demonstrate and explain

Contact the nearest sales office of The Eimco Corporation, P.O. Box 300, Salt Lake City 10, Utah.

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B-378

USERS OF **NEW**
ROEBLING HERRINGBONE* WIRE ROPE
HOLD THESE TRUTHS TO BE SELF-EVIDENT...

That Herringbone is the most practical and *needed* wire rope development to come along in years.

Herringbone, the regular lay and Lang lay rope, is actually two-ropes-in-one rope. Thus, the qualities that make these two ropes *good* ropes, combine to make Herringbone *excellent*.

HERE'S WHY:

The steel core of Herringbone provides the *ideal* support for the two pairs of Lang lay and one pair of regular lay strands used in its construction. In addition, the outer wires are heavier for extra abrasion resistance, and good flexibility is maintained by the finer wires inside. This combination of features enables Herringbone to give *longer service* in most applications.

Herringbone has been used on a wide variety of excavating equipment and tough hoisting jobs with impressive results. Its applications are practically unlimited on installations which call for all-steel ropes and on many where fiber core ropes are now being used. Another of Herringbone's added attractions is the fact that it eliminates the necessity for stocking Lang lay rope for one job and regular lay for another.

Your Roebling Distributor has Herringbone right now. He has, also, copies of a brochure describing Herringbone, the newest Roebling Star Performer. If you wish, write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for literature and anything you'd like to know about Herringbone.

*Reg. App. For

ROEBLING

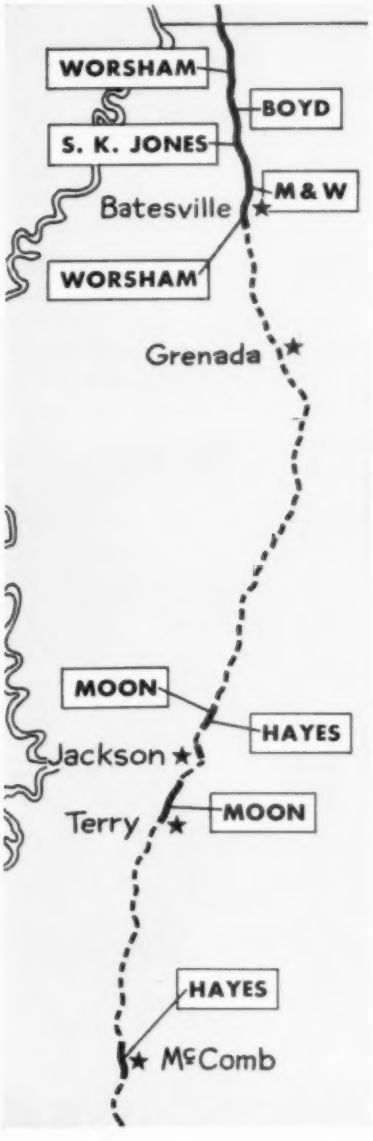
Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

HERRINGBONE
WIRE ROPE

CONTRACTORS FIGHT "WORST WEATHER IN HISTORY" TO

Punch new interstate main line through Mississippi

With big fleets of Allis-Chalmers construction machinery, contractors battle wet weather to move millions of yards of tough Mississippi clay, mud, sand and gumbo. More than 140 miles of the state's 676-mile proposed interstate system is currently completed, under construction, or awarded. The main line is U. S. 55 which runs generally parallel to U. S. 51 from the Tennessee line near Memphis south through Jackson to the Louisiana line. The new road will have a minimum of four lanes, be controlled access and are planned for expansion to six or eight lanes, if necessary. A check of the jobs in progress shows some of the problems . . . and how the contractors are solving them.



Worshams Work Near Tennessee Line

Worsham Brothers, contractors from Corinth, Mississippi, are working a five-mile section of U.S. 55, between Aldens and Hernando, Mississippi, near the Tennessee line. About a million yards of dirt is involved in the $986,000 contract. An additional four-mile section of U.S. 55, immediately south of Batesville, has been awarded to Worsham Brothers on a bid of $923,000. Work will begin in the early spring. The firm, a partnership of three brothers, Frank, Clifford and LeRoy, specializes in airport and highway construction in Mississippi, Alabama and Tennessee. The Worshams are using big tractors, motor scrapers and motor graders from their Allis-Chalmers fleet to keep the Interstate 55 job well ahead of schedule. Moving 9,000 to 15,000 yards every 10-hour shift, the company is making the most of every working day. By October, 1958, they had completed 62% of the work, with only 52% of the contract time elapsed.

(Continued on next page)

Frank Worsham, Jr.

Heaped scrapers kept constantly on the go during the rare dry periods is the Worsham Brothers formula for beating bad weather and tough dirt.

... move ahead with ALLIS-CHALMERS

Punch Main Line Through Mississippi

Boyd Builds Highways on the Run

Averaging up to 18 miles per hour — hauling 12,000 to 17,000 yards of sandy silt every 10-hour working day — keeps the Boyd job ahead of schedule. The Boyd Construction Company, Grenada, Mississippi, is working a seven-mile section of U.S. 55 between Coldwater and Senatobia. Eighty percent of the yardage is being handled by Allis-Chalmers TS-360 motor scrapers — with fast, effective loading boosts from Allis-Chalmers HD-21 crawler tractors.

Moving earth at high speed is a Boyd specialty. The company, in business since 1939, handles contracts averaging 1½ to 2½ million dollars annually, covering general highway and bridge construction and earth moving, as well as levee work on the Mississippi River.

On the U.S. 55 job, more than 2¼ million yards of fill are being

John Boyd

moved from borrow pits to build a 4-lane roadway across the headwaters of the Arkabutla Reservoir.

Unusually wet weather permitted only 20 working days during the first 5 months of last year. Now, Boyd is counting on his Allis-Chalmers machines to make up for lost time. The big TS-360's hauling 7 to 9 loads per hour on cycles up to 2 miles, are averaging up to 1,400 yards every 10-hour working day. The sandy silt coming out of a 2,000,000-yard borrow pit is running 3,000 pounds to the yard — yet Boyd's TS-360's are making excellent time in spite of spongy haul roads.

Wet Clay Complicates M & W's Section

W. C. Mathews and H. M. Whitfield are M & W Contracting Company of Tupelo, Mississippi.

W.C. Mathews

Mathews and Whitfield specialize in earthwork and structure construction on all types of highway, drainage, water, sewer and airport contracts. The company's fleet of

High-speed hauling helps the Boyd Construction Company keep its sections ahead of schedule. These 20-yd Allis-Chalmers motor scrapers average 7 to 9 loads an hour on cycles up to 2 miles.

...move ahead with

Allis-Chalmers motor scrapers, tractors and motor graders is rapidly completing the last cut and fill on the company's 5½-mile section of U.S. 55 during a mid-November survey of the job.

The $1,832,000-contract calls for 1,300,000 yards of excavation and 10 structures. Two of the structures are connected with a channel change on the Talahatchie River, where a horseshoe bend will be straightened and the old bed filled.

Mathews pointed to two reasons for this being his toughest stretch of road since his stint, during World War II, on General Pick's staff, building the Ledo Road in Burma. The two obstacles — wet weather and a subsurface strata of heavy red clay that stayed wet, even during the rare dry periods. The clay strata hampered all contractors working Mississippi's interstate main line U.S. 55 from the Tennessee line south to Batesville. Beginning two to three feet below the surface, it ran down far enough to plague most of the cutting operations. Invariably, Mathews pointed out, we'd get down to grade just as we were getting to good dirt!

M & W's Allis-Chalmers fleet helped beat both problems by moving heaped scrapers of the tough clay on a 10-hour-a-day, 6-day-a-week schedule . . . whenever weather permitted. Both men and machines performed so well that M & W's section is well ahead of schedule — 58% complete, with only 34% of contract time elapsed by October, 1958. This kind of performance is one reason for M & W's standardization on Allis-Chalmers construction machinery in the twelve years since they went into business.

S. K. Jones Awarded Four-Mile Section

The four-mile section between Senatobia and the State-Panola County line was awarded to S. K. Jones Construction Company, Memphis, Tennessee. The company began work with its Allis-Chalmers fleet in December, 1957, and with more than 900,000 yards of material to move, has managed to stay on schedule during the prolonged wet weather. The Jones Company's contract figure of about $641,000 includes four structures.

Moon Works Three Subcontracts for Interchanges and Frontal Roads

John H. Moon & Sons, Ridgeland, Mississippi, holds subcontracts on three sections of the new interstate main line. Two of these,

John H. Moon

between Jackson and Ridgeland and at Byram, Mississippi, call for structures only. The third, a four-mile section between Jackson and

(Continued on next page)

(Left) One of M & W's Allis-Chalmers motor graders handles finish grading in the cut. (Right) Top maneuverability of Allis-Chalmers motor scrapers lets M & W's big tractor-scrapers load in both directions . . . saves time by reducing travel for pusher tractors.

ALLIS-CHALMERS...power for a growing world

Punch Main Line Through Mississippi

Terry, is for construction of two underpasses and four frontage road bridges to convert present U.S. 51 to the controlled access U.S. 55. More than 630,000 yards of excavation is required. Moon is using medium-sized Allis-Chalmers motor scrapers and Allis-Chalmers crawler tractors to handle the earthwork — building frontal roads, approaches to overpasses and cutting drainage ditches. His hydraulically controlled scrapers, with positive down pressure — available only in Allis-Chalmers motor scrapers — are very effective on close-quarter ditch work where deep, short cuts are required. October reports show Moon has completed 47% of the work in only 33% of contract time.

Hayes Has Two Main Line Jobs

In each of the past ten years, J. R. Hayes Construction Company, Paris, Tennessee, has moved 10,000,000 yards of earth — or more. In addition to its highway

J. R. Hayes

contracts, the company handles clay stripping, street and airport work and asphalt paving in Mississippi and Tennessee. Right now, the firm is under contract to move a total of 5,000,000 yards on five jobs.

One of these is the 7½-mile section of interstate highway 55 near McComb, Mississippi—more than 1,500,000 yards to be moved in 360 workingdays. Hayes' fleet

Positive, hydraulic down pressure on the scraper bowl and plenty of push from the Allis-Chalmers torque converter crawler help operators cut a short deep drainage ditch on John H. Moon & Sons' job.

Three of J. R. Hayes' big Allis-Chalmers TS-360 motor scrapers are shown in the cut. Loads like the one on the right, plus excellent cycle time, helped keep work ahead of schedule in spite of bad weather.

...move ahead with

of Allis-Chalmers TS-260 and TS-360 motor scrapers moves as much as 15,000 cubic yards per 10-hour day — more than 100 loads per day per machine with hauls ranging from 500 yards to a mile (one way). With this kind of performance, Hayes expects to complete the job ahead of schedule, in spite of bad weather.

Another Hayes job on the Mississippi main line is a three-mile section between Jackson and Ridgeland. The $159,000-subcontract calls for more than 452,000 yards of excavation to rebuild the existing two-lane road, add a second double-lane roadbed and construct access roads to bring the existing U.S. 51 up to interstate specifications.

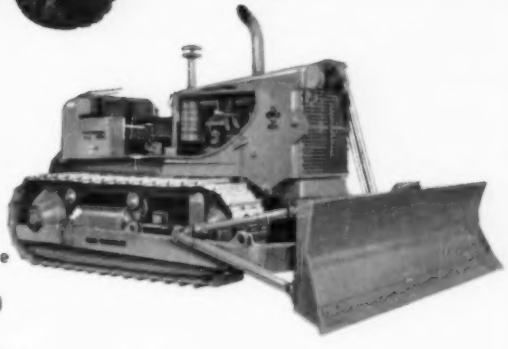
Hayes' fleet of Allis-Chalmers large and medium-sized motor scrapers heap loads in fast . . . average more than 100 loads per day per machine on hauls up to a mile.

As the story indicates, Mississippi highways are moving ahead at a rapid pace with Allis-Chalmers construction machines in the thick of the action. Performance on jobs like this proves their work capacity as the national highway system spreads across the country. Ask your dealer to show you Allis-Chalmers equipment at work on the *big* jobs in your area. Then, talk to the owners for the real low-down on Allis-Chalmers production ability. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

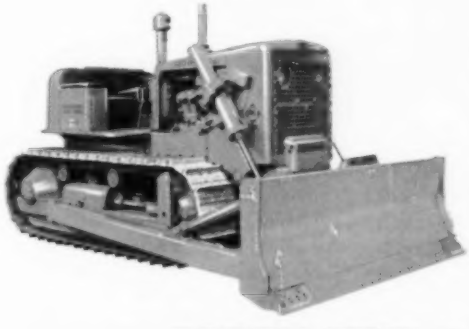
Machines like these set the pace

TS-360
20 yd heaped
280 hp
49,050 lb (approx.)

TS-260
17 yd heaped
230 hp
39,600 lb (approx.)

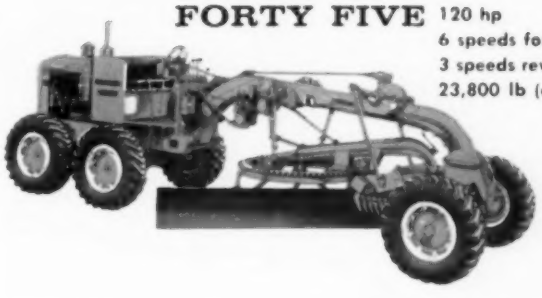


HD-21
225 net engine hp
Torque converter drive
56,260 lb
(approx. as shown)



HD-16
Torque converter drive
150 net engine hp
39,090 lb
(approx. as shown)
All-gear drive
148 net engine hp

FORTY FIVE 120 hp
6 speeds forward to 20.6 mph
3 speeds reverse to 7.0 mph
23,800 lb (approx.)



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ALLIS-CHALMERS ...power for a growing world

Excavating Engineer
founded 1905 JANUARY 1959

Scraper empties load as grader turns to continue haul route maintenance task. Job requires 1.8 million yards of excavation.

Smoky Mountains Make Room For Interstate Highway

IN heavily wooded mountain country near Asheville, N. C., one of the South's toughest road jobs is being pushed to completion. It's the construction of a 3.6-mile link in a federal interstate highway designed to eventually carry traffic now handled by narrow, twisting and often dangerous U. S. 70.

When entirely completed, the double-barreled, limited access route will join with other interstate systems at Roanoke, Va., to the east and at Knoxville, Tenn., to the west. From Knoxville, motorists will travel southeast over the Great Smoky Mountains, enter North Carolina at Waterville, head northeast and leave the state near Reidsville, N. C.

Roadway Details

Designed for speed, safety and freedom from driving tensions, the roadway will have twin pavements, each with 25-ft. travel widths and 10-ft. shoulders. There will be a 4-ft. wide, slightly raised median strip, maximum grades of 5% and a right-of-way averaging 260 feet wide.

Building a highway to these specifications in the mountains of North Carolina is no job for an inexperienced contractor. In the 3.6 miles now under construction, 1.8 million yards of excavation are required. Fifteen fills of 100,000 yards and more are involved, including one that alone will take 740,000 yards of material.

Officials of Asheville Contracting Co., Asheville, N. C., knew well the country through which the new interstate highway link was to be built. It's land where craggy towers of solid rock jet majestically skyward, drop sharply into deep gorges, then rise up again to reach above sister peaks. Bidding a job in such terrain demands careful planning and accurate cost estimation.

After making several test drillings and a thorough study of the area, Asheville Contracting Co. submitted a low bid of $1.4 million for grading on the job. This firm felt there existed a stratum along most of the project's length seldom found in these mountains. It was, they said, not a formation of solid rock but contained earth and rock under a cap of granite that after blasting could largely be moved by a fleet of dozers and scrapers.

Their hunch on the stratum not being solid rock was right. Within six months after jumping off, Asheville Contracting Co. crews had the job 50% complete with only one-third of the allotted working days used.

Before grading actually got underway, certain tasks had to be accomplished. An access road to service the

Grading of rugged 3.6-mile link in the interstate system is 50% complete six months after work began. Road has 260-ft. wide right-of-way which must be blasted out of mountainside.

Powerful International TD-24 bulldozes big yardage to help keep earthmoving ahead of schedule. Road will have twin 25-ft. wide travel lanes, each with 10-ft. shoulders.

job had to be built; 65 acres of land had to be cleared of timber; 35 acres of grubbing had to be done; and big earthmoving machines had to be brought in over terrain even hard to negotiate on foot. Unusually heavy spring rains didn't make these already difficult undertakings any easier.

Grubbing Chore

Timber clearing was finished in 10 weeks with a crew of 35 men using Homelite chain saws and hand axes. Cat D8 and International TD-24 dozers then moved in to whip the grubbing chore.

Project Manager W. W. (Woody) Ledbetter had to get his power shovels and scrapers to the job site over what appeared to be almost impenetrable terrain.

"We hauled the big stuff," related Ledbetter, "on lowboy trailers as far as possible up roads serving people living back in these mountains," which are often nothing but gutted, twisting trails. "They were then unloaded and walked cross-country to the job location. We'd try as many as six different avenues of approach before getting the equipment where it was wanted. Sure, plenty could go wrong moving a shovel up or down a 60% grade, but in this business you've got to take chances."

Initial excavation was started on both ends of the job, where huge cuts are being blasted out of the mountainside. On the south end, a 1½-yd. Bucyrus-Erie 38-B shovel loads broken gray granite into two 15-yd. Euclid rear-dumps, which haul to a nearby fill requiring over 100,000 yards of material. On the north end, two new 15-yd. International Payhaulers and a 15-yd. Euclid make about a 300-yd. run from the loading face of a 4,900-ft. long, 186-ft. deep cut to end dump rock and earth into the 740,000-yd. fill, which measures nearly 1,100 feet wide from toe to toe at its widest point and 122

(Left) A 1½-yd. shovel and a 15-yd. Euclid rear-dump team up to clear granite from huge cut on south end of job. (Below) Cat D7 waits to level rock unloaded in fill.

Euclid and Cat scrapers and a D6 dozer work in fill below drilling scene. Grading is expected to be finished by this spring.

feet deep from its lowest point upward to required grade elevation.

Power digging in the giant cut is being done with a 2-yd. Bucyrus-Erie 51-B shovel. Equipped with a 225-hp model D337F Caterpillar diesel engine and a Torcon torque converter, it loads out some 2,100 yards of material in an 11-hour shift. The 38-B has been averaging about 1,500 yards for the same period. Dipper teeth and lips of both machines must be hardsurfaced regularly with manganese rod to protect against excessive wear from the extremely abrasive material being dug. This is done in the field with 300 and 250-amp Hobart portable arc welders, both of which are kept on hand for maintenance and repair work.

Powder holes for shooting are put down on 8 x 9-ft. centers with crawler-mounted Gardner-Denver drills using 3½-in. Brunner & Lay carbide-tipped Rok-Bits on Gardner-Denver drill steel. Compressors include an Ingersoll-Rand 900-cfm and two Gyro-Flo 600's. Material is broken down fine enough so that it can be easily handled by the shovels and scrapers. Ammonium nitrate, boosted by 2 x 16-in. sticks of Austin 60% gelatin-type dynamite, is the explosive used in blasting.

A concrete dam built some 25 years ago limited shots to 12-ft. vertical lifts during the first weeks of construction, a contract specification that was later modified. Suffering from extensive water seepage and located very near the highway job, owners of the dam feared a series of sizeable explosions might further weaken the structure and demanded protection against such a probability. Asheville Contracting Co. made a vibration study in effort to have the lift restriction dropped, which would mean a substantial reduction in overall grading costs. A seismograph was placed on the dam, after which two successive shots were set off—one of a 12-ft. lift and one of a 30-ft. lift—some 4,900 feet away. Results proved conclusively that danger to the dam was no greater when detonating a 30-ft. lift than when detonating a 12-ft. lift.

Although the job contains considerable shovel work, a good portion of blasted material can be moved by tractor equipment. A Cat D8 and International TD-24 with ripper attachment doze material for and pushload two 12-yd. Euclid S-12 and two 18-yd. Cat No. 470 scrapers, which are pulled by DW21 rubber-tired tractors. A Cat D6 bulldozer spreads scraper-placed earth, and a Cat No. 12 motor grader smooths haul routes from cuts to fills so that scrapers can make fast round trip cycles. Another International TD-24 and Cat D8 have worked together in opening the job along its entire length. Two Cat D7's normally push material unloaded by the end-dump trucks. Grading with this equipment can follow no set pattern because the terrain is so rough and the stratum unpredictable.

(Below) Air Force surplus rig handles 6 x 8-ft. sections of tar-coated, corrugated metal being used in constructing two 544-ft. lines of 78-in. diameter drainage pipe. (Left) Crewmen bolt the sections together, then caulk seams to make pipe watertight.

Project Manager W. W. Ledbetter (right) and Shovel Foreman Hub Reighard study plans before making their next move.

(Above) Blast holes are put down with Gardner-Denver drills using 3½-in. carbide-tipped Rok-Bits. (Below) Powderman places sticks of 60% gelatin-type dynamite.

In addition to its grading task, Asheville Contracting Co. must install 9,700 feet of drainage structures. This includes laying two 544-ft. lines of 78-in. diameter pipe along the length of the 740,000-ft. fill. Erected 4 feet apart, they will carry Wilkens Creek under the highway into nearby Waterville Dam reservoir.

Bolt Pipe Sections

Each line is being constructed of 1 to 5-gauge, 6 x 8-ft. sections of tar-coated, corrugated metal, which are bolted together and then caulked along their seams to make the pipe watertight. The corrugated sections weigh up to 550 pounds each and are handled by an Air Force surplus rig designed to salvage wrecked air planes. It has an 18-ft. telescoping boom and power unit, both mounted on a flat-bed trailer pulled by a Studebaker cab. Highly mobile, the rig is perfectly suited for its assigned job.

Good supervision and excellent job organization have enabled Asheville Contracting Co. crews to meet the challenge of this backbreaking project. It is hoped grading will be completed this spring, well ahead of a 300-working day deadline and only one year after work began. Sub-base and paving contracts are to be let at an unknown future date, perhaps when grading for the entire highway is complete.

In addition to Project Manager Ledbetter, key personnel for the Asheville firm on this job include D. K. Walsh, chief mechanic; John McClincy, drill and powder foreman; Hub Reighard, shovel foreman; and Bill Payne, pipe foreman. Baxter H. Taylor is president of Asheville Contracting Co. and Sam H. Bushnell, Jr., is vice president.

(Below) Asheville Contracting Co.'s 2-yd. shovel swings a heaping dipper of rock and earth over 15-yd. International Payhauler, which hauls to a 740,000-yd. fill.

Swift hydro-electric project's 512-ft. high embankment containing 15½ million yards of material is world's highest earthfill dam.

First Kilowatts from Swift Dam

WATER backed up by the world's highest earthfill dam structure has begun to generate electricity. Swift Dam in Washington harnesses a plunging Cascade Mountains torrent to generate power for homes, farms and factories of the Pacific Northwest. Its powerhouse is scheduled to be in full operation this month.

Construction of the recently completed dam was a 30-month task for more than 1,000 men working with shovels, earth haulers and compaction equipment. The man-made mountain of dirt has a crest 512 feet above its foundation—higher than a 40-story skyscraper. Its 15½ million-yd. bulk plugs the Lewis River valley in the southwestern part of the state of Washington.

Swift Dam, however, is named for Swift Creek—a rushing mountain stream that joins the Lewis River just above the dam site. It is a joint hydroelectric development of the investor-owned Pacific Power & Light Co., which has its headquarters in Portland, Ore., and the publicly-owned Utility District of Cowlitz County, Wash.

The dam's base is 1,950 feet thick. It was built up, yard upon cubic yard of earth and rock, by end-dump trucks and bottom-dump carriers. The massive mound is tapered toward its crest. When the last load was dumped last November, the mound had a crest 2,100 feet long and 30 feet wide. Behind the mound will be a reservoir of 740,000 acre-feet of water.

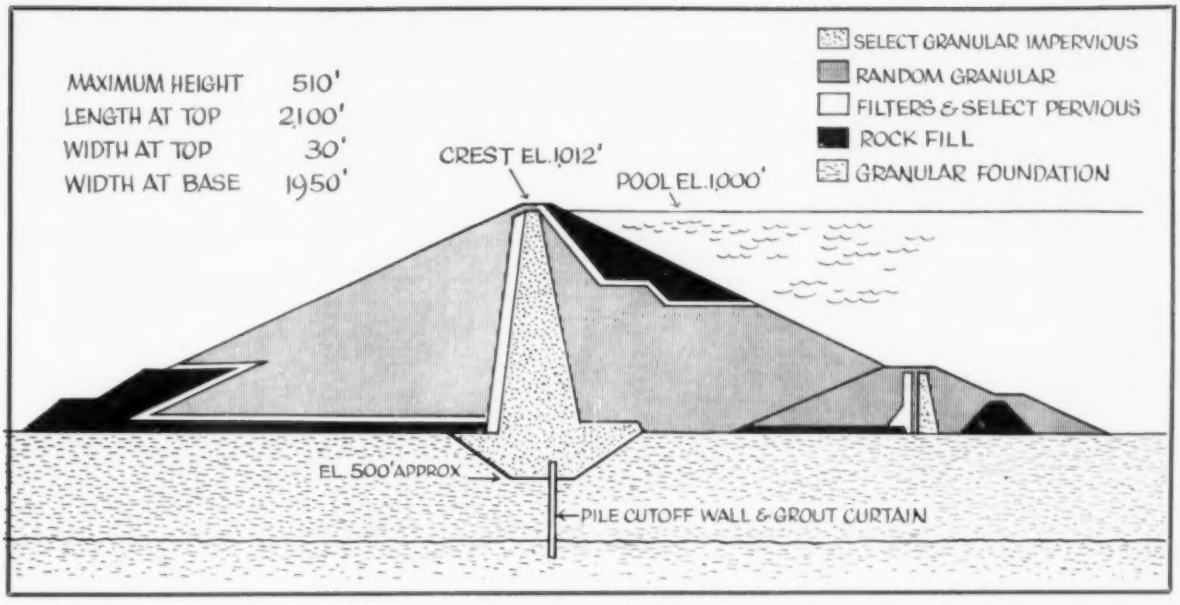
Two Powerhouses

Three 68,000-kilowatt turbine-generators are installed at Pacific Power & Light's powerhouse at the dam site and two 35,000-kilowatt generating units are in the Public Utility District generating plant at the end of a canal three miles below the dam.

Located in an area of heavy storms that sweep off the Pacific Ocean in winter and benefiting from summertime melt of Cascade snowfields, the two powerhouses have a combined annual output capacity of about 924 million kilowatt hours of electricity in years of average water conditions.

Swift reservoir will be a 12-mile

Three 68,000-kw turbine-generators increase capacity for P P & L Co.



Cross-section of embankment shows earth and rock composition. At its base, dam is one-third mile thick. Reservoir lies to right.

long lake with a pool level 1,000 feet above sea level when filled to maximum. The reservoir will not be full until early in spring.

Water from the reservoir falls through a 1,575-ft. long power tunnel to three 107,000-hp (Francis-type) turbines. Operating at a full 378 feet of head, the Swift No. 1 plant units are capable of a maximum output of 250,000 kilowatts. From the main powerhouse at the tow of the earthfill structure, the water flows down a 3½-mile canal to a diked forebay behind the Public Utility District power plant called Swift Powerhouse No. 2. There the water drops another 128 feet to be harnessed by two 35,000-kilowatt generators.

Third Dam

The Swift development is the third and largest PP & L project along a 36-mile stretch of the Lewis River as the stream plunges from the foothills along Mount St. Helens, a 9,600-ft. volcanic cone to the north of the dam, and along the fir-clad shoulders of Mount Adams, a rocky 12,000-ft. peak to the east.

Cost of the PP & L development is estimated at $56 million including transmission facilities. The PUD's phase of the project is estimated at about $18 million.

Immediately downstream from Swift lies another lake backed up behind Yale Dam and its 108,000-kilowatt (maximum output 133,000-kw) powerhouse. And directly below Yale begins Merwin Dam—PP & L's pioneer Lewis River project. The concrete-arch Merwin Dam has a powerhouse now being expanded by the installation of a third 45,000-kilowatt turbine-generator unit.

Work on Swift Dam, begun in May 1956, has changed the geography of an area more than 17 miles long. Design of

(Left) Buried deep in the dam's foundations is a cutoff wall designed to prevent seepage. Bottom portion is steel sheetpiling driven down 90 feet to bedrock. (Right) A 30-ft. high concrete wall extends the cutoff into the impervious core of the fill.

Downstream from Swift are Yale and Merwin dams. Muddy and Meadows dams are contemplated projects farther upstream.

the dam structure has many unique features that have attracted international engineering interest.

Buried beneath the earth dam is a steel and concrete cutoff designed to prevent seepage under the embankment. After the excavation of the alluvial gravels to a depth of about 100 feet below the former streambed, a positive cutoff was achieved by driving interlocking H-section beams to bedrock. The pilings, ranging in depth to 90 feet, form a 300-ft. long curtain-like row of 15 by 18-in. cells across the foundation zone. These cells were scoured empty of gravel and refilled with concrete to perfect the seal.

Inside the dam itself, as fill materials were placed, a vast chimney-like drain of rock was formed along the downstream face of the impervious core of the structure. The drain carries away any moisture which might penetrate from the reservoir of the dam.

Reduces Excavation

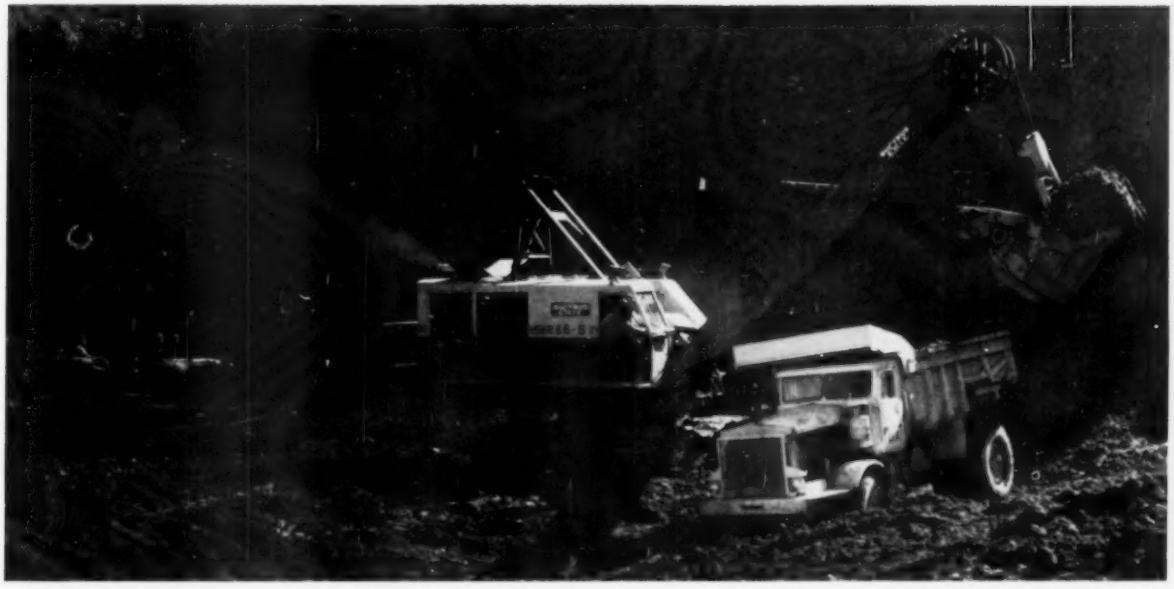
"Design of the cutoff eliminated costly additional excavation while providing a positive cutoff to rock," according to E. Robert de Luccia, vice president and chief engineer of Pacific Power & Light Co. "The rock drain assures the stability of the slope of the downstream shell while making it possible for a steeper slope to be used for the embankment structure."

Construction design and management of the Swift power project was assigned to Bechtel Corp., San Francisco, Calif., which had a field corps assigned to the project at a camp located east of Cougar, Wash.

Contract for the diversion tunnel work, the cofferdam, which becomes a part of the finished main embankment, and the foundation zone excavation was performed by Guy F. Atkinson Co., South San Francisco, Calif. This work was begun in May 1956.

Contract for the main embankment, the forebay-spillway and power tunnel work at Swift No. 1 was held jointly by J. A. Jones Co., Charlotte, N. C., and Chas. H. Thompkins, Washington, D. C., who moved crews onto the job in November 1956. Construction of the Swift No. 1 powerhouse for PP & L

Scoop and haul, pile and pack describes the project. Some 22 million yards of excavation from the dam foundations, from borrow pits, for the forebay-spillway and for the downstream canal kept shovels, like this Manitowoc 4500, busy for 30 months.



In 6-ton bites, a 4-yd. shovel digs glacial deposits ideally suited for fill material. About 800,000 truck-loads were required.

and the work on the Cowlitz PUD's canal, forebay and Swift No. 2 powerhouse were also contracted by Atkinson.

As a preliminary to the earthfilling operation, the Lewis River was shunted around the site through a 32-ft. horseshoe-section diversion tunnel punched 2,990 feet through rock of the mountain that forms the south abutment of the dam. That diversion took place November 1956. The old streambed was then dug away to make the foundations for the main embankment dam.

Building the embankment was a high speed operation. Maximum amount of fill placed in one day was 66,000 cubic yards by crews working two 10-hour shifts. During the period from Aug. 14–Sept. 29, 1958, the contractor placed 2 million yards of embankment.

Some 16 miles of valley highway were relocated. The job included spanning the Swift Creek canyon with a 437-ft. long truss bridge. Its deck is 255 feet above streambed, one of the highest in the state of Washington.

Excavation of 1,580,000 cubic yards of earth and 891,000 yards of rock for the forebay spillway was completed in February 1958, while crews erected a massive whirley crane for handling materials for the spillway-gate and trash rack structures. The chasm-like forebay, which is 755 feet long and 200 feet deep, and the 1,750-ft. long spillway chute were lined with concrete. Two radial gates, located at the crest and above the power tunnel intake at the foot of the forebay, control the reservoir level. The spillway has a capacity of 150,000 cubic feet per second, but will be rarely used.

The power tunnel was bored through rock by sub-contractor A. J. Cheff Co., Seattle, Wash. The 25-ft. diameter tunnel is 1,575 feet long.

Lining of the tunnel and the three 13-ft. diameter penstocks was contracted by American Pipe & Construction Co., Portland. The big steel cylinders were fabricated at an outdoor assembly line at the project.

A dramatic feature of the tunnel and spillway area is the surge chamber designed to ease back-pressures in event of emergency closing of the penstock valves at the powerhouse. Measuring 55 feet in diameter and 200 feet deep, the vertical surge chamber rises from the power tunnel and will permit any surge of hydro-power to spill harmlessly.

The quarter-million kilowatt capacity indoor-type powerhouse is 190 feet long and 77 feet wide. A 60-ft. high steel structure erected on top of the 58-ft. high sub-foundations is sheathed with

Here is Swift Dam during construction. Sprawling expanse of the earthfill is illustrated by a 300 x 100-ft. football field superimposed on photo. Broken lines outline the present height of the dam, which measures 512 feet from foundation to crest.

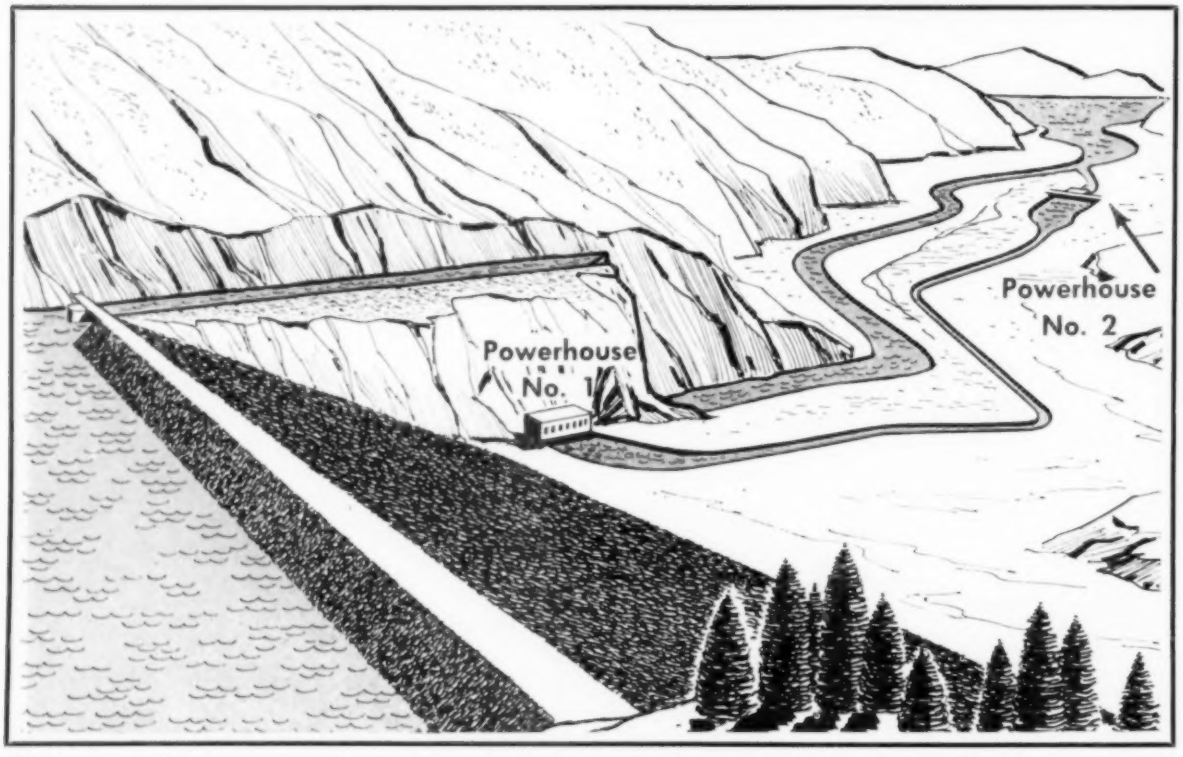
aluminum. The plant crane has a capacity of 300 tons.

Installation of the turbine and generator equipment and appurtenances took place during 1958. The first unit at Swift No. 1 was tested last July.

"Completion of Swift increases the maximum power generating capacity of Pacific Power on the Lewis River to 533,000 kilowatts," reports PP & L President D. R. McClung.

Pacific Power has a license pending with the Federal Power Commission to build a fourth project on the upper Lewis valley at the head of the lake formed behind Swift. This project will be known as Muddy Dam, with a capacity of 110,000 kilowatts. And higher on the foothills of Mount Adams amid a mountain meadows area for which the development will be named, Pacific Power is studying the possibilities of another project—Meadows Dam. This structure would collect flows of four streams and drop water 2,200 feet down the side of a mountain—the highest hydrohead in the nation.

Lima crane unloads 25-ft. diameter steel sections which are welded to form lining for 1,575-ft. long power tunnel.



Artist's perspective shows project features. Dam impounds reservoir at left. Main powerhouse is located at toe of dam. Overflow spillway lies along south abutment above No. 1 powerhouse and spills into the normal Lewis River channel. Water from the PP&L No. 1 powerhouse flows down a 3½-mile canal into No. 2 powerhouse built as companion project.

General Motors Expands Diesel Line

DETROIT Diesel Engine Division of General Motors Corp., Detroit, Mich., has added eight new basic units to its line of two-cycle diesel engines. Formerly covering the 30 to 893-hp power range, the GM diesel line has been broadened to include single, multiple and turbo-powered engines ranging from 20 to 1,650 hp.

There are now 13 basic engines and six multiple units in the line.

The expanded line is significant to the construction and roadbuilding industries in two ways. The new engines meet exacting power requirements in the lower horsepower ranges. They also supply in compact packages the greater horsepower constantly being required for bigger and bigger earthmovers and other construction machinery.

Following a three-year program of designing, refining and testing, Detroit Diesel has developed four new single "V-type" engines in the "71" series ranging from 252 to 675 hp and a new group of smaller engines known as the "53" series ranging from 20 to a maximum of 195 hp.

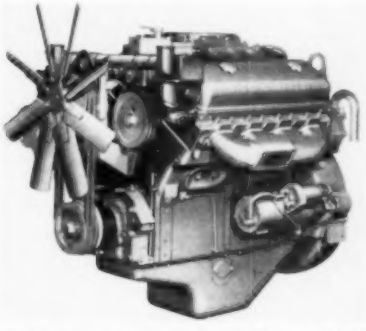
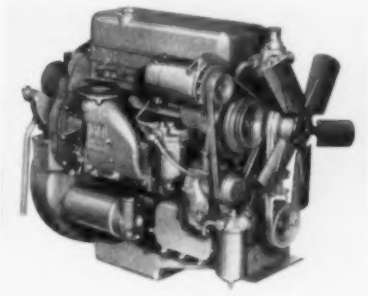


Photo shows space-saving design of GM's new V-type diesels. The V-engines are available in 6, 8, 12 and 16-cylinder units ranging from 195 to 675 max. hp.

The new "V" additions to the "71" series include a six cylinder unit of 252 maximum horsepower (the 6V-71); a 334-hp (maximum) 8V-71 model; a 504-hp 12V-71 model; and a 675-hp 16V-71 engine. In addition to 6-71 and 110 multiple units, 12V-71 and 16V-71 twins are now available delivering up to 1,008 and 1,350 maximum horsepower, respectively. When turbopowered, the 16V-71 twin will deliver up to 1,650 hp.

The new "53" series includes "in-line" engines of two, three and four cylinder units ranging from 20 to a maximum of 130 hp. Also in this new line is a six-cylinder "V-type" engine of 195 maximum horsepower.



This four-cylinder "in-line" engine is one model in the completely new "53" series. Compact "53" engines now make diesel power practical for equipment ordinarily powered by gasoline engines.

The "V" configuration of the new units along with their two-cycle design present new compactness and low weight-per-horsepower. In most instances they can be installed in space ordinarily occupied by engines of considerably less horsepower. The new 334-hp 8V-71 is almost 6 inches shorter and takes up approximately 8% less "cube" space than the 252-hp 6-71E "in-line" engine. The same 334-hp 8V-71 engine is nearly 15 inches shorter and is 2⅞ inches narrower than the 335-hp 6-110 "in-line" engine.

Design of the new engines, maintains the wide interchangeability of parts long associated with GM diesel engines. In the entire line there are only three cylinder sizes. Consequently, pistons, rings, valves, valve operating mechanisms, injectors and many other parts are interchangeable, engine for engine, within each series.

The series 53 engines are basically scaled-down versions of series 71 units. Their operation and maintenance will present no problems to mechanics familiar with previous engines in the line.

In the lower horsepower ranges, the 2, 3, 4 and 6-cylinder "53" engines will in most cases greatly exceed the work done by gasoline engines from 20 to 200 hp in such applications as small wheel and track-type tractors, loaders and hoists; auxiliary engines on truck mixers, cement and asphalt paving equipment; power units on ¾-yd. and smaller shovels; and in core drills, air compressors and generator sets.

GM Diesel Power Line

Previous Models	New Engines	BHP	
		Continuous	Maximum
	2-53	20-35	47
2-71		33-48	67
	3-53	38-64	97
3-71		51-75	118
	4-53	51-87	130
4-71		75-113	167
	6V-53	76-130	195
6-71		112-170	252
	6V-71	112-170	252
6-110		160-237	335
Twin 4-71		150-226	334
	8V-71	150-226	334
Twin 6-71		224-340	504
	12V-71	224-340	504
Twin 6-110		320-474	670
	16V-71	300-454	675
Quad 6-71		448-680	1008
	24V-71 (Twin V-12)	448-680	1008
	32V-71* (Twin V-16)	600-908	1350*

*When turbocharged 1,650 hp.

The extent to which diesel size and weight have been reduced in "53" series is illustrated by this test installation of a three-cylinder GM 3-53 diesel in this ⅜-yd. hoe.

From Stone to Steel

Utah limestone-dolomite quarry pit keeps pace with U. S. Steel's furnaces.

by Ray Day

SIX miles west of Payson, Utah, where foothills of the rugged Wasatch Range jut down to the ancient shores of Lake Bonneville, is a somewhat unusual rock quarrying undertaking. The quarry is out of the ordinary because limestone and dolomite —both used in steelmaking—are found in the same location and can be mined from one pit. The Columbia-Geneva Steel Div., of U. S. Steel Corp., is owner-operator of the quarry.

Both limestone and dolomite are essential to steelmaking. With iron ore and coal, they combine as raw materials to make the finished product. Limestone is used as a flux to take impurities from iron ore in both open-hearth and blast furnaces. Dolomite's use is twofold. It forms a refractory lining for open-hearth furnace bottoms, and it is used as a flux in blast furnaces.

The steel company's property is known as Keigley quarry, and was named after C. T. Keigley, who was general superintendent of Utah operations of the former Columbia Steel Co. The property first was opened up in 1943.

Geology

The Keigley quarry limestone and dolomite are sedimentary rocks partly made up of the organic remains of marine life deposited about half a billion years ago, when most of the area around Salt Lake City was under water. Chemically, limestone is calcium carbonate. When a large part of the calcium in a limestone is replaced by magnesium, the result is dolomite rock which, chemically, is a calcium magnesium carbonate.

The rock occurs as sedimentary beds, Cambrian in age, which dip at an angle of approximately 45° from the horizontal. The limestone strata being quarried have a total thickness of about

500 feet, and are overlain by a much thicker series of dolomite. Limestone reserves occur in both the Teutonic and Herkimer series, and the Bluebird, Opex and Cole Canyon sections are dolomite. Reserves of both types of rock are adequate for many years to come. Dolomite reserves are roughly two times greater than that of limestone.

The property is only 18 miles by rail to the steel plant at Ironton, and 28 miles by rail to the Geneva plant.

In addition to its use for steelmaking,

Loading of all shattered limestone at Keigley quarry is handled by two 3-yd. shovels, each of which handles 3,000 tons per shift.

Pit layout, similar to local Utah copper mines, is well organized. A total of 14 working faces 500 feet long have been opened up with benches averaging 35 feet high.

the company sells commercial stone chiefly to nearby cities, towns and counties. It is excellent for road building, driveways and parking areas.

The quarry has been developed as a well-organized open pit, working the area in much the same manner the local Utah copper mining companies have used in developing their open pit mines. At Keigley quarry, 14 working faces 500 feet long now have been opened up, with benches 35 feet high and 35-ft. berms.

A system of good haul roads, maintained to 30-ft. width by a pull-type grader, connects the various benches with the processing plant, about a mile from the pit center. The present setup was made so that the processing plant is lower in elevation than quarry levels. This, of course, permits hauling downhill. When the pit is developed to its ultimate, there will be some uphill hauling.

Drill Types

Three types of drilling and shooting are done. Main bench drilling, where 7⅞-in. diameter holes are being sunk 40 feet deep—five feet below the bench toes—is being handled by a heavy-duty rotary drill. Additional compressor coolers have been installed on this machine, the rotoclone dust collector has been removed, and light water sprinkling keeps down the dust from drill cuttings. Large-diameter holes are being put down on a staggered grid pattern, with holes 15 feet between centers.

Standard practice in drilling one of the benches with a big-diameter rotary is to put down four rows of holes back of the face, and to shoot them all at once. Fertilizer grade ammonium nitrate from a new addition to the steel plant at Geneva is being used as a blasting agent in all big-diameter drill holes. The material is mixed with diesel fuel at the rate of 0.8 gallon per 100 pounds. The detonator consists of alternate 1-ft. lengths of regular Primacord and 400-series Primacord detonating fuse, strung from the bottom of the drill hole to the top. Drill cuttings, which accumulate around the top of the hole, are used as stemming material so that the blasting media will be closely confined during the blast.

To improve fragmentation and reduce vibration, the company is using millisecond delays between each row, and between every fourth hole. Fragmentation has definitely improved since this type of delay shooting was introduced.

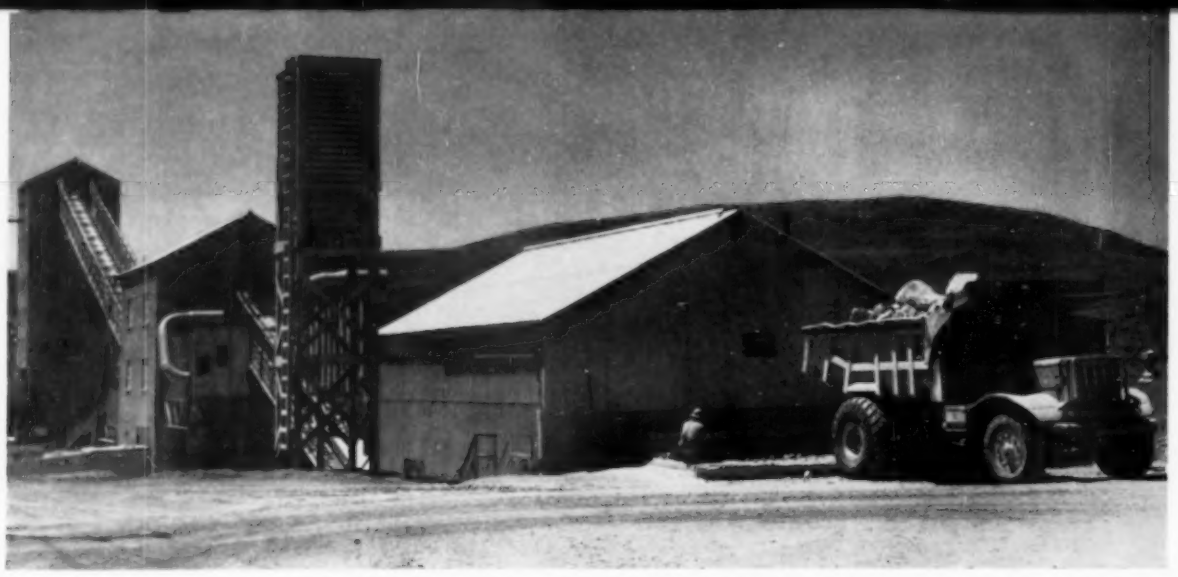
A second type of drilling is handled by an Air Trac mounted 4-in. drifter, using 3-in. drill bits. A wagon drill also is used with this machine, employing smaller tungsten-carbide insert bits.

Air for these machines is supplied by two 800-cfm stationary compressors, discharging into receivers and delivery pipelines. There is also a 235-cfm portable, which is towed around for some of the spots inaccessible for making hose connections.

Drilling done by these machines is confined to those areas where holes are only 8 to 20 feet deep. These occur in certain areas where benches are being developed, where corners must be dug out, and in other miscellaneous locations where access is difficult. Average hole pattern on 3-in. work drops down to a 6-ft. staggered center grid, so that fragmentation equal to larger diameter drilling can be developed. These smaller holes, however, are also being shot with compounded ammonium nitrate, fuel oil and Primacord. The loading and firing method is the same as on larger diameter work.

The third type of drilling is done by a self-propelled drill, which handles all

A chemist runs a sample of quarried rock. Because quality of stone varies, material from different pits is blended together to insure a continuous uniform quality product.



A 12-yd. truck prepares to dump quarried limestone into a floor hopper; in the background are crushing and screening plants.

secondary drilling on large boulders. One operator maneuvers this machine on its three rubber tires, and also controls the action of its air-powered drill from a control cab on the boom. This machine sinks small-diameter holes in oversize boulders, which it can either reach along the blasted rock toe, or can work on after oversize chunks have been kicked aside by a loading shovel.

Shallow holes drilled by the machine into boulders are loaded with half a stick of 40% gelatin, equipped with electric detonators. There is no fuse lighting, waiting and indeterminate shooting at Keigley; when a shot is ready it is hooked up and after sufficient warning and precaution it is fired electrically, usually during lunch time or at the end of a shift.

Loading and hauling fleet features high-capacity equipment of the latest type, both in shovels and hauling units. The shovels are two 3-yd. machines equipped with diesel engines, torque converters and air controls. There is also a 2½-yd. shovel in use.

The shovels are distributed three ways. One of the 3-yd. machines has been placed almost exclusively on stripping, but it can, if necessary, be switched to stone. The other 3-yd. machine has been assigned to limestone and dolomite loading. The 2½-yd. machine is being used to load out some of the finished product from stockpiles.

Drill cuts 7⅞-in. dia. blast holes 40 feet deep with rotating tri-cone roller bit.

Blend Stone

There is a considerable variation in the quality of stone, from bed to bed and from face to face. It frequently is necessary to blend or mix stone from different faces in order to insure continuous uniformity of the end product. Because of this, both shovels do a considerable amount of moving from one location to another.

Hauling units consist of nine trucks, diesel powered by the same size and type engine used in the 3-yd. shovels. That has helped to standardize and reduce the equipment maintenance problem. The trucks, rated at 24 tons of payload capacity, have been increased by building up sideboards so that 27 tons can actually be hauled. The hauling units are equipped with torque converters, transmissions and torqmatic brakes.

The trucks are loaded by backing in under the shovels, using a double spotting arrangement. They take about five full dippers from a 3-yd. shovel. The material averages about 2,700 pounds per cubic yard.

In average digging in peak operations, each of the 3-yd. shovels will move about 3,000 tons per 8-hour shift. Normally the work is on a 5-day, double-shift basis per week.

Auxiliary equipment around the pit floor includes an electric-drive-steer rubber-tire dozer, whose 206-hp engine and torque converter drive lets it scoot around the property rapidly and efficiently. This machine is used for pit

cleanup work around the shovel, for dumping jobs on high stockpiles, for shoving waste material over the ends of dumps, and for railroad car moving. A tractor with a 13-ft. dozer blade also is used, mostly for stripping ahead of the loading shovel. It shoves waste material in to the stripping shovel.

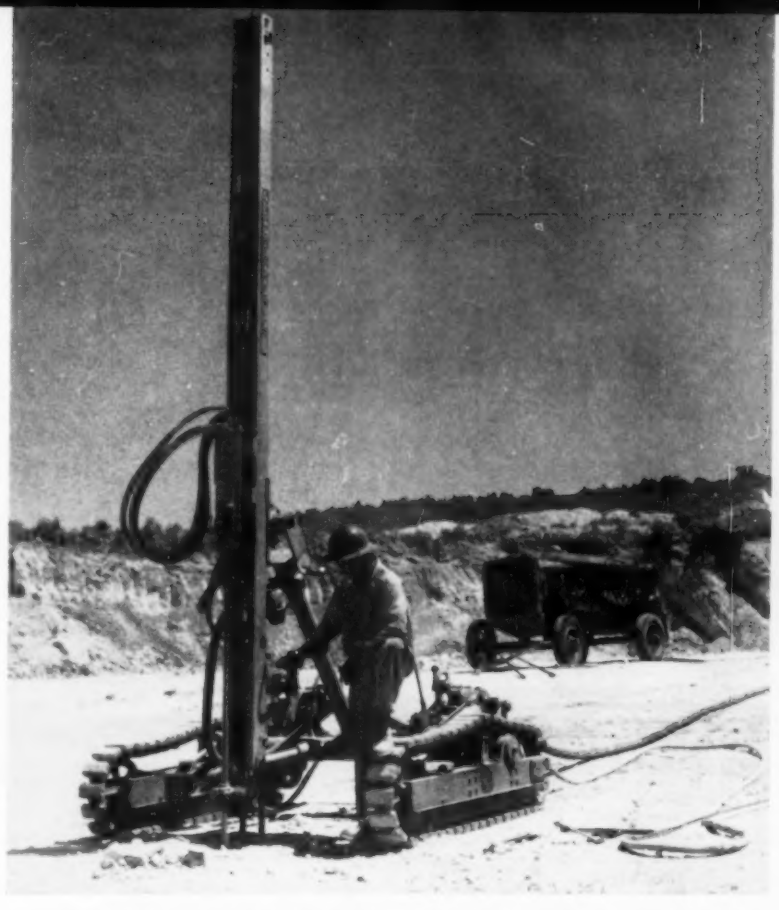
Pit floor and haul roads are under continuous truck sprinkling, and the pit faces also are water sprinkled to keep down dust.

After a 1-mile downhill haul, the trucks dump to a 50-ton primary hopper. From this hopper, run-of-quarry stone is conveyed on a 4 x 12-ft. apron feeder, which sends it to a 48 x 42-in. jaw crusher. Driven by a 200-hp electric motor, this crusher reduces large size chunks of material so that they will pass its normal opening of 8 inches.

Crushing Setup

The crushed rock discharges to a 30-in. wide inclined belt conveyor, which carries it to the top of the secondary crusher building.

Here, the belt discharges into a rock box feeding a two-deck vibrating screen. This screen is 5 x 12 feet in size, and is equipped with a 9-in. square scalping screen on the top deck, and a 2½-in. square opening plate screen on the bottom deck. Oversize material from the top deck discharges directly into a 4-ft. electric-driven gyratory crusher, while undersize material passing through the bottom deck bypasses this crusher. The 9 x 2½-in. intermediate fraction either may be fed to the crusher, or may be



(Above) Air Trac mounted drill is assigned to blast holes in restricted areas or places where the work is shallow. Holes are 3-in. diameter and from 8 to 20 feet deep. (Below, left) Unique air-powered drill handles secondary drilling. Easy positioning of drill gun permits the machine to quickly sink a sloping hole in large slab (right).

(Left) Rubber-tire dozer cleans up one of the spoil piles. (Right) A 3-yd. shovel strips overburden on an upper level of quarry.

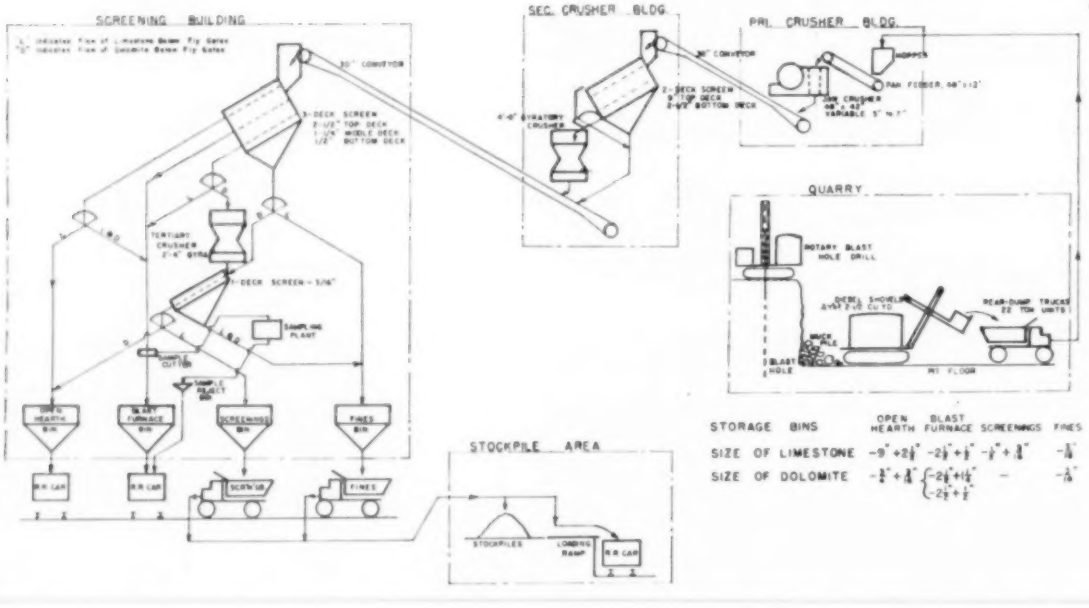
bypassed, depending on the products desired. The secondary crusher is usually set to reduce all material to sizes ranging from 2½ to 1¼ inches, depending on the degree of reduction required.

From the secondary crusher, material is elevated on a 30-in. conveyor to the top of the screening station, where it discharges into a rock box feeding a 5 x 12-ft. three-deck vibrating screen. The top deck of this screen is equipped with a steel plate with 2½-in. openings, the middle deck has woven wire screen with 1¼-in. openings, and the bottom deck has a wire screen with ⅝-in. openings. All openings are square.

Various fractions are conveyed through chutes to railroad car loading bins. In the case of open-hearth dolomite, the 1¼ x ⅝-in. fraction is sent to a 2-ft. 4-in. gyratory crusher for further reduction. Discharge from this crusher, together with the ⅝ x 0 fraction from the three-deck screen, is passed over a 5 x 12-ft. single deck vibrator, whose screens have 3/16-in. rectangular openings.

Four principal product sizes are as follows: open-hearth lime, 9 to 2½-in.; blast furnace limestone, 2½ to ⅝-

LIMESTONE AND DOLOMITE FLOW SHEET FOR KEIGLEY QUARRY, PAYSON, UTAH



STORAGE BINS	OPEN HEARTH	BLAST FURNACE	SCREENINGS	FINES
SIZE OF LIMESTONE	-9" +2½"	-2½" +½"	-½" +⅜"	-⅜"
SIZE OF DOLOMITE	-1½" +⅝"	{-2½" +1¼" / -2½" +½"}	—	-⅝"

Many miles of haul roads are sprinkled regularly to keep down dust, making truck work safer, more efficient. This sprinkler unit takes on 2,500 gallons of water.

in.; open-hearth dolomite, ¾ to 3/16-in.; and blast furnace dolomite, 2½ to 1¼-in.

The 1¼ x ⅝ fraction reduced in the last gyratory crusher makes open-hearth dolomite.

The finished product from the mill is carefully sampled, and every car is automatically sampled before it leaves for the rail journey to the two mills. A field laboratory also is in continuous operation to check the various characteristics of this material.

Excellent Program

The preventive maintenance program which the company has set up is unusually thorough. Facilities at the quarry include an eight-stall garage, equipped with general repair tools, a welding shop with portable gas and electric welding units, a complete bit sharpening and blacksmith shop combined and an electrician's shop.

By standardizing on equipment and maintaining it in line with manufacturers' recommended practices, the company has stretched the useful life of equipment converters, transmissions and engines to about 6,000 hours before major overhaul. It used to be that 5,000 hours was considered good, but that has gone up because of careful attention to lubrication, proper fuel and operating adjustments. Tire service has stretched from 6,000 to 8,000 hours, and tires are good for at least two recaps. A portable lubrication rig visits the machines in the field, and shop facilities also are available for rolling stock which can come in to the yard.

Keigley quarry is under the general supervision of L. F. Black, manager, Utah operations, with R. M. von Storch as general superintendent of coal mines and quarries. Field operations are under Ray Pett, superintendent of Keigley quarry, assisted by Reed Horton, quarry foreman; Marshall Fisher, foreman of maintenance and mill; Justin Lamb, night foreman; Ralph Hammerstrom, quarry engineer; Jack Openshaw, superintendent of safety and quality control; and J. I. Taylor, supervisor of accounting.

Ray Pett, quarry superintendent, searches constantly for ways to improve efficiency of the Keigley operation. He is shown here on a morning inspection.

Railroad cars are loaded and assembled at the screening plant to make up a train bound for the Geneva Works of U. S. Steel's Columbia-Geneva Steel Division.

Aerial photo shows the Geneva Works as it exists today. Wasatch mountain range in background is snowcapped most of the year.

Steelmaking in Utah Has Colorful History

Efforts to utilize plentiful iron and coal deposits date back more than a century. Present Columbia-Geneva Steel Div., U. S. Steel Corp., had numerous unsuccessful predecessors.

The Geneva Works of U. S. Steel is a fully integrated steelmaking facility. Together with the Ironton plant and Consolidated Western Steel Division's Utah pipemill, they form the realization of a dream more than a century old. For behind these modern facilities is a story as interesting as any adventure which led to the growth of Utah and the West.

The story concerns the development of the iron and steel industry in the region, and is an important part of the Beehive State.

Two and a half years after the first Mormon pioneers arrived in the Salt Lake Valley in 1847, an exploring expedition led by Parley P. Pratt discovered significant deposits of iron and coal in the area which now surrounds Cedar City, in Iron County, Utah.

Because the pioneers were anxious to become self-sufficient as quickly as possible, plans were laid immediately for an iron industry. Within 12 months, a colonizing company of 118 men—30 of them accompanied by their families—were enroute to southern Utah to build what they hoped would, one day, be an industrial center. Under the leadership of George A. Smith, they left Provo on December 16, 1850 and journeyed by oxen team to the area now occupied by Cedar City. There they established the small community of Coal Creek.

Crude Furnace

Here, with their nearest neighbors 200 miles to the north and 500 miles to the south, they built a crude blast furnace. In the summer of 1852, the first pig iron made west of the Missouri River was produced in this furnace. A blacksmith, Burr Frost, made enough nails from the first iron to shoe the horses.

In the meantime, at the request of Brigham Young, the Deseret Iron Co. was organized in 1852, in Liverpool, England, to provide capital for the venture, and skilled ironworkers and colliers were also induced to come to Utah. This company purchased the small blast furnace and began to enlarge its facilities, but despite urgent efforts and hard work, the venture was not a financial success.

The task of iron manufacturing on the western frontier had been started with high hopes. The iron ore was of good quality, and coal was available nearby. The coal, however, proved to be inferior for baking into coke, and although the deposits were not far from the iron ore beds, they were high in the mountains and difficult to reach. The pioneers had hoped for a banner output in 1853. They had put every available dollar into the venture, and the territorial government had provided a substantial subsidy.

But just as things were most encouraging, the nearby Indians went on the warpath, and all energies had to be directed toward the preservation of life. The 1853 catastrophe was complete when a cloudburst in the canyons caused a destructive flood. It swept away dams, bridges and the road to the coal mine. Debris piled high around the iron works. The flood carried away charcoal, wood and other valuable supplies.

Subsequent attempts to start an iron industry in southern Utah were made in 1854 and 1868. The latter continued in production for 15 years, but finally, like its predecessors, was not a financial success. In 1883, it too, ceased.

In 1915, the production needs of World War I prompted the organization

of the Utah Iron & Steel Co., subsequently incorporated as the Utah Steel Corp. A plant was built at Midvale, just south of Salt Lake City, which originally had a single open-hearth furnace with a daily capacity of 150 tons of steel. A second furnace was added later. But cancellation of government contracts at the close of the war brought financial ruin to the enterprise, so it was totally abandoned.

Since that time, the industry has recovered steadily and successfully. The efforts of Utah Steel Corp. had attracted the interest of the old Columbia Steel Co. of California, and in 1924 Columbia erected a blast furnace at Ironton, near Provo. This operation, using coke made from Utah coal, iron ore smelted with the aid of limestone and dolomite was the first successful ironmaking venture in Utah. Columbia was purchased by U. S. Steel Corp. in 1930.

War Expansion

Development of the Geneva plant started in 1941–42, when the federal government decided to build additional steel production facilities in the West as a precaution against possible closing of the Panama Canal by enemy attack. That would have seriously affected the Pacific Coast shipbuilding situation.

At the request of the government, U. S. Steel designed the new Geneva plant to meet the federal requirements. It was built for the government without charge or fee by U. S. Steel. The site, about six miles northwest of Provo, was chosen because it possessed adequate transportation and was a minimum distance from sources of iron ore, coal, limestone and dolomite. The accessibility of sufficient fresh water was another important consideration.

The first pig iron was smelted at the new plant in January 1944, followed by the first open-hearth steel a month later. When the war ended, the plant gradually slowed to standby operations, and on May 23, 1946, the War Assets Administration adjudged U. S. Steel's bid for the plant and inventories to be the best of many submitted. U. S. Steel then took over private operation of the plant in June 1946. The plant is now an integral part of the Columbia-Geneva Steel Division of the parent corporation.

A new nitrogen products plant was completed in 1957. It is first of its kind in a major steel plant in the United States. The new facility combines hydrogen from coke oven gas and nitrogen from the air to synthesize valuable fertilizers and nitric acid.

Reversible Fan for Radiator Aids Operator's Comfort

A NEW reversible-blade radiator fan can be operated as either a suction or blower fan to compensate for temperature changes from one day to the next or from morning to night.

Conventional fans usually require one or more hours to reverse direction of air flow. The new Huber fan can be reversed right on the job within a couple of minutes—no trips to the shop or maintenance station.

On a frosty morning the operator can reverse the fan on his equipment to blow the hot air from the engine back to his seat. As the temperature becomes warmer during the day, he can reverse the fan to blow heat away.

The Huber fan also permits a quick change to allow the operator to blow dust and leaves out of the radiator.

No tools or extra parts are needed to change the fan. The operator stops his engine, grabs the outer edge of the fan blades, one at a time, pushes them inward towards the fan bearing and turns the blade clockwise until it stops to make it a blower fan.

Or he can reverse the operation, pushing the blades in and turning them counter-clockwise, to make a suction fan.

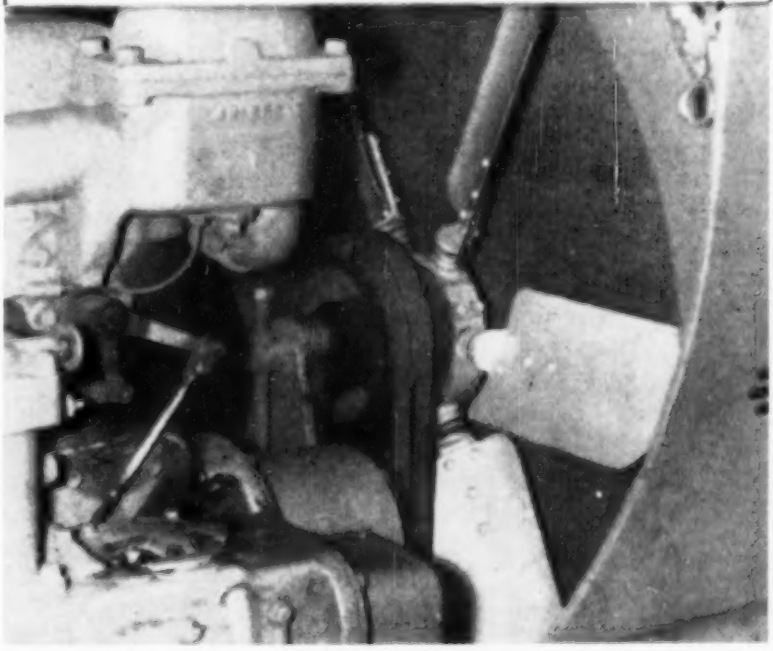
Lock Firmly

In either position, when the blades are in proper position, an automatic locking pin drops into place, locking the blades firmly in place.

The Huber fan was designed mainly for use on dozers, but is adaptable to graders, scrapers, shovels and other earthmoving equipment.

The reversible fans now are being used by a group of contractors working on the Erie Thruway in Erie County, Pa., which will connect with the New York State Thruway.

The fans are made by the Huber Reversible Fan Mfg. Co., Department EE, P. O. Box 1911, Erie, Pa.



Reversible fan is shown here installed on engine of dozer. Several contractors working on Pennsylvania's Erie Thruway are using the equipment on their tractor units.

NEW DW20
Series G

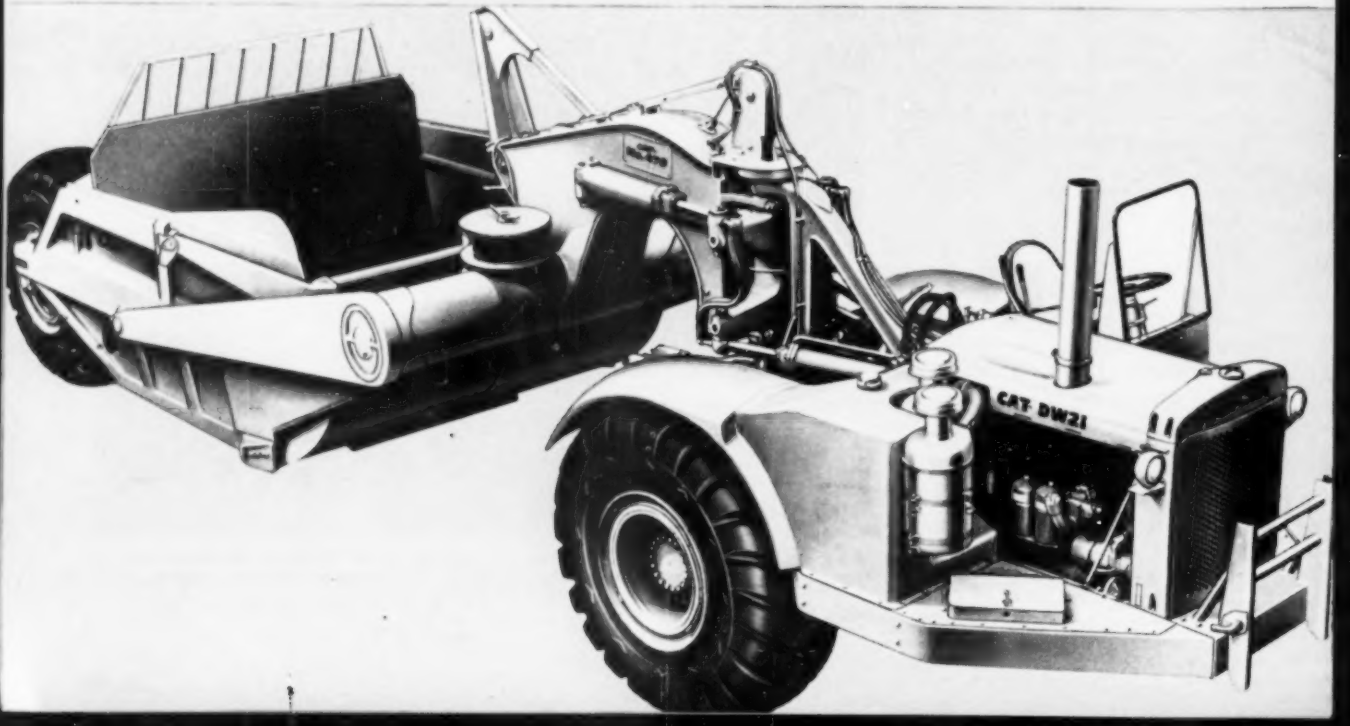
NEW No. 456
Series B

NEW HP —345 (maximum output)—increased 8%
NEW RIMPULL —39,565 lb. (maximum)—increased 12%
NEW SPEEDS —increased rimpull—provides up to 20% faster travel speeds under normal haul road conditions
NEW CAPACITY—19.5 cu. yd. (struck)—increased 8%
27 cu. yd. (heaped)—increased 8%

NEW DW21
Series G

NEW No. 470
Series B

NEW HP —345 (maximum output)—increased 8%
NEW RIMPULL —49,100 lb. (maximum)—increased 12%
NEW SPEEDS —increased rimpull—provides up to 20% faster travel speeds under normal haul road conditions
NEW CAPACITY—19.5 cu. yd. (struck)—increased 8%
27 cu. yd. (heaped)—increased 8%



PROJECT PAYDIRT* *pays off for you*

NEW CAT DW20 and DW21 SERIES G TRACTORS NOW 345 HP

—plus new high-capacity LOWBOWL Scrapers for faster cycles and higher production!

For down-to-earth facts about these big new Caterpillar rigs, take a look at the box scores shown here. They summarize important increases in horsepower, rimpull, speeds, scraper ratings and tire capacities that pay off for you *on the job* with faster cycles, greater production and more profit!

Note that the increased HP of the DW20 and DW21 Series G, compared with the models they're replacing, gives 12% higher rimpull. This increased rimpull provides up to 20% faster travel speeds under similar haul road conditions. Equally important, this horsepower increase was achieved without any sacrifice whatsoever in the excellent torque characteristics inherent in the Cat Super-Turbo Engine. Torque rise of the engine in the Series G models is unequaled in the earthmoving industry.

In addition to the advantages featured in the box scores, the new Series G Tractors and their matching LOWBOWL Scrapers deliver the *proved* reliability of Caterpillar-built machines. To handle increased horsepower and increased capacity, both have been improved in design and structure. The tractors, for example, have stronger final drive gears and improved transmission shifter forks. The scrapers have stronger bowls, push frames, draft frames and aprons. All these and other improvements result in better service life, less maintenance and lower cost dirt.

Here are modern, heavy-duty wheel rigs geared to the needs of today's highly competitive market—rigs that meet your requirements for moving more dirt at lower cost than ever. Get the complete facts about them from your Caterpillar Dealer. Call him today and set a date for a demonstration!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

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BORN OF RESEARCH
PROVED IN THE FIELD

TIRES: 29.5-29 (28-ply rating) are now standard in place of the former 29.5-29 (22-ply rating)—a tire capacity increase of 16% to match the increased scraper capacity, heavier machine weight and higher speeds made possible by more HP. Note: On the DW20 Series G, the front tires remain the same—14.00-24 (16-ply rating).

***PROJECT PAYDIRT:** Caterpillar's multi-million-dollar research and development program — to meet the challenge of the greatest construction era in history with the highest production earthmoving machines ever developed.

New Jersey's Booming Sewer Business

Newest hoe in Renda's lineup is this 1-yd. 30-B working on a short sewer line serving Metuchen (N. J.) high school. About 2,000 feet of 8-in. Transite pipe is to be laid.

THREE conditions describe the state of sanitary sewer facilities in the rapidly expanding suburban areas of many East Coast states, according to one construction industry spokesman. Communities either have older, outdated sewers badly in need of replacement; their more modern, recently-laid sewers are now overloaded because of the boom in housing for the past several years; or they don't have any sanitary lines at all.

Many communities in New Jersey, as in neighboring states suffer from chronic tax dollar shortages. They have had to depend upon private septic tanks rather than costly sewer gathering and transportation systems to dispose of sewerage. In years past when these areas were sparsely settled, this method of handling the problem was no threat to community health. The last decade's growth in housing and industries, however, has changed the picture.

Today throughout New Jersey, sanitary districts have undertaken multi-million dollar sewer programs to take care of present and future needs. The construction will take years to complete.

For smaller and medium-sized firms, sewers are a steady source of contracts. They provide outstanding opportunity for specialization in that type of excavating.

One contractor which has taken good advantage of the situation is Renda Contracting Co., Inc.

Owner Ernie Renda operates a thriving sewer contracting business out of Green Brook township near New Brunswick, N. J. Ernie has a thoroughly established reputation, among municipalities of the Garden State and bordering states, for high quality workmanship in laying pipe. "You can't tell a pipe went through here, he does such a nice clean job," said one New Jersey official.

Construction of sewers in suburban areas near big East Coast cities offers market potential for small contractors. Here's how one New Jersey contractor has expanded his business.

Ernie Renda (left) talks over sanitary sewer job in Edison township, N. J., with George LaTourette, representing the township engineer, and Walt Grigoruk, foreman.

Big Schedule

Renda had close to $2 million in contracts last year. The jobs included a $338,000 sanitary installation in Fairfax County, Va.; a $996,000 sewer in Hellertown, Pa., which ties in with the city of Bethlehem main line; a $147,000 job in Cinnamon townshop in southern New Jersey; a $382,000 job in Edison township in northern New Jersey; and a $30,000 line in Metuchen borough, also in the northern part of the state.

"I haven't done a job anywhere where I couldn't go back and do more work," Ernie remarked proudly, when *Excavating Engineer* toured his jobs near New Brunswick. He pointed out some of the things which made for good relations not only with public works officials but

directly with residents of areas in which he was working.

In most areas Renda keeps his jobs closed up tight—sometimes as short as 200 feet. Such job organization is by no means the most economical way of digging and replacing dirt. It is less costly for a contractor to open up long stretches of trench at one time in order for him to use trenching, pipelaying and backfill crews to the fullest possible extent.

Close behind the pipelaying and backfill men, Renda sends in paving crews. He doesn't let his backfilled trench lay long for traffic to knock apart. As soon as fill material settles, he puts pavers and blacktop trucks on the line giving the street its original appearance.

The firm has been in the sewer business eight years, and it has 11 hoes ranging from ½ to 1½-yd. capacity. All are Bucyrus-Eries including two 15-B's, six 22-B's, one 30-B and two 38-B's.

Other major equipment consists of a dozen loaders and dozers. There are three Michigan 125A rubber-tired loaders with 1½-yd. capacity and two 75A's with 1-yd. capacity. Crawler tractors used are an Allis-Chalmers HD-6 and HD-4; two Caterpillar D4's and three D6's.

In the truck fleet are 10 International and Mack dump trucks of 6 to 12-yd. capacity and five pickups. For lighter earth digging, the firm also has a Barber-Greene trencher.

For transporting excavators and tractors, two Rogers trailers are used. They are 40-ton and 50-ton models, each pulled by Autocar DC100 truck cabs.

Pipe joints are sealed with ring of jute and a hot pour of Elastite compound.

"Ernie deserves a lot of credit," one of his business associates said, "because he started out from scratch on practically nothing."

Buys Dozer

After spending four years in the Army combat engineers in the Southwest Pacific, Ernie came out of service in 1946. Shortly thereafter, he bought a surplus D4 from the government and went into business as a grading subcontractor. In 1949, he bought a ½-yd. 15-B hoe and went after basement digging in a big way. In 1950, he decided to give sewer construction a try.

What makes a sewer contractor successful?

Ernie says it's a combination of three factors—getting the right variety and sizes of equipment to save the cost of replacing expensive pavement; getting dependable experienced personnel; and, most important, knowing yourself what must be done and seeing to it that your men are doing it.

A hardworker himself, Ernie keeps close control over operations. He hits as many of his widely scattered jobs as he can each day. You won't find him in business dress along the construction line. Most of the time he wears work clothes. According to one of Ernie's close friends, he keeps a business suit in his car at all times. When the time comes to meet important officials, like members of the sewer commission, he makes a quick change from his work clothes to dress suit in any handy gas station.

Renda's sewer work in Edison township and the borough of Metuchen is part of a $2 million dollar construction program by the Middlesex County Sewerage Authority. The plan calls for construction of two outfall sewer lines and a series of secondary trunks and collecting systems. The entire setup will empty into a 66-in. diameter ocean outfall line, which serves the Raritan River valley.

The work is divided up into three contracts. Verona Construction Co., Verona, N. J., is building 18,500 feet of 42 and 36-in. diameter pipe in contract 1. Frank Domenick Construction Co., Newark, N. J., has 8,600 feet of 24-in. outfall line in contract 2. The third contract is Renda's. He has 63,000 feet of conduit from 6 to 24-in. diameter. Both clay and concrete pipe are being laid, but all pipe over 12 inches in his sections is concrete. Site of Renda's work is only a short distance away from the boundaries of Camp Kilmer, a well-known army base.

Any sewer contractor digging in New Jersey is apt to run into three conditions—shale, loose sand and copious amounts of ground water. All of contract 3 in Edison township is in shale formations of varying thickness and hardness. The shale starts about three

While a 1½-yd. hoe trenches, a Michigan 125A loader brings load of vitrified clay pipe. Renda's $382,000 contract in Edison calls for 63,000 feet of 6 to 24-in. pipe.

feet below ground; so that means most of the trench digging is rock. The depth of the cut runs about 8 to 12 feet on the average, with a maximum depth of about 28 feet.

Digging the shale is a ticklish job. First, there are numerous intersecting utilities—gas and water lines—for which hoe operators must watch. Then, the operator must put to use all the brute force of the machine to break through and rip out the layers of rock.

Renda had a 1½-yd. 38-B and three ¾-yd. 22-B hoes in Edison township. All the machines have pickpoint equipped dippers for pounding and breaking action. In addition, one 22-B has a heavy-duty crawler mounting with 30-in. wide treads replacing the normal 26-in. width. The wider mounting gives the machine added stability for gouging out rock and helps absorb shocks so that the machine doesn't bounce.

Depending upon the depth, the amount of rock and intersecting lines, trench progress generally runs about 300 feet per day. Because the clay pipe is laid on a hard rock bottom, contract specifications call for a 12-in. bed of ¾-in. gravel to be placed under the sewer.

Between joints a jute ring is installed and sealed with Elastite sewer joint compound. On concrete pipe, Rub-Lok rubber gaskets are used. Concrete pipe is supplied by Lock Joint Pipe Co., East Orange, and clay pipe by Brick & Tile Corp., Newark.

Much different digging conditions from the Edison sewer job are being encountered by Renda's crews in Metuchen, a borough slightly to the northeast. There, under a $30,000 contract, a sanitary sewer is being built to connect the borough's new high school and a nearby housing project with an existing trunk line.

(Above) An Allis-Chalmers HD-6G loader with 1½-yd. bucket dumps backfill. (Below) Here's some of the shale Renda's crews dug constantly. The hoe is a ¾-yd. 22-B.

Sandy Soil

The 2,000 feet of 18 to 20-ft. deep trench at the high school were the most difficult of Renda's local contracts. The soil is sandy and the deep excavation makes ground water a serious problem. Hoes must dig an open cut 30 feet wide across the top to safeguard crews from cave-ins of the loosely packed sidewalls.

Because the trench was deep and wide requiring a sustained excavation effort, Renda decided to test the digging ability of a brand new Bucyrus-Erie 30-B hoe he had just added to his stable. The 1-yd. machine is air-controlled. According to operator Scotty MacDonald, the 30-B is "terrifically fast."

The digging at the high school is easy and the excavator can easily pull out 200 yards per hour, heaping the dipper. The best day's performance on the job was 156 feet of sewer laid or 12 lengths of Transite pipe which came in 13-ft. lengths. The asbestos cement pipe used was a Johns-Manville brand, joined together with Ring-Tite joints. Diameter was 8 inches.

Total employees of the Renda organization number about 90 during peak operating season. Fred J. Fella is company engineer; Bill Majoris, superintendent, and Walt Byers, senior excavator operator. Office and garage of the firm are located on U. S. route 22, Green Brook township.

Supervision of sewer construction work in Edison township is handled by William M. Rimmey, township engineer. R. P. Wilson Associates, Paterson, N. J., are consulting engineers to the Middlesex County Sewerage Authority, sponsor of the project.

An 8-ft. long ripper tooth penetrates about four feet breaking up frozen clay overburden at a mine in northern Minnesota.

Rippers Speed Winter Earthmoving

by W. A. Haley

Mining Representative,
Sales Development Div.,
Caterpillar Tractor Co., Peoria, Ill.

COLD weather spelled the end of construction in years past, but ingenious contractors today are finding ways to keep their machines working on through the winter. Frozen ground has stopped scrapers or necessitated expensive blasting, but now powerful tractor-mounted rippers are clearing the way to full-scale operations.

Frozen ground is as hard as rock. Scrapers and dozer blades can grind away without penetrating. But Luhr Brothers, a construction firm from Columbia, Ill., worked 28 consecutive days during the coldest part of last winter on the $50 million Plymouth automobile assembly plant at St. Louis, Mo., using a Caterpillar D9 tractor with a mounted No. 9 ripper. Temperatures dipped to 6° below zero, and the clay froze to six inches deep overnight. The big D9 shattered the frozen clay, allowing the contractor to get to the unfrozen, workable material underneath.

Use of tractor-mounted tools to loosen frozen material extends work season.

Loosen Borrow

Contractors Lee & Fox—a joint venture from Lexington, S. C.—brought in a D8 tractor with mounted No. 8 ripper to break up the estimated 250,000 yards of excavation on their project for grading, drainage and paving 12.7 miles of U. S. highway 276 in Laurens County, S. C. When freezing temperatures coupled with rains threatened to shut down the job, the alert contractors ripped the frozen material, opening up the cuts to their high speed scrapers.

Extensive testing on the Mesabi iron range by a tractor manufacturer during the winter season of 1957–58 has proved the economies of ripping instead of blasting frozen overburden. Caterpillar Tractor Co., Peoria, Ill., conducted the tests. Ripping is faster and more practi-

Overburden frozen to a depth of about 24 inches breaks off in a large, unwieldy slab as a large electric powered shovel digs the untouched material from the bank.

In contrast to the photo showing removal of untouched material, the dipper takes a big bite out of a bank that has been ripped by tractor. The pieces are easy-to-handle.

cal. Results showed savings of up to 26 man shifts per day in time and reduction of over 50% in costs on jobs worked by the 320-hp D9 tractor equipped with a Kelley 8-ft. ripper.

It has long been a practice on the Mesabi range to save overburden removal for the cold winter months when ice on the Great Lakes stops shipping and to mine iron ore during the warmer months. Extreme cold of the winter causes frost to set in early, sometimes reaching a depth of six feet or more.

Tough Digging

Power shovels are used to load the material into hauling units, but are limited to about 18 inches of frost. Deeper frost is too hard for shovels and mines usually resort to drilling and blasting to loosen it.

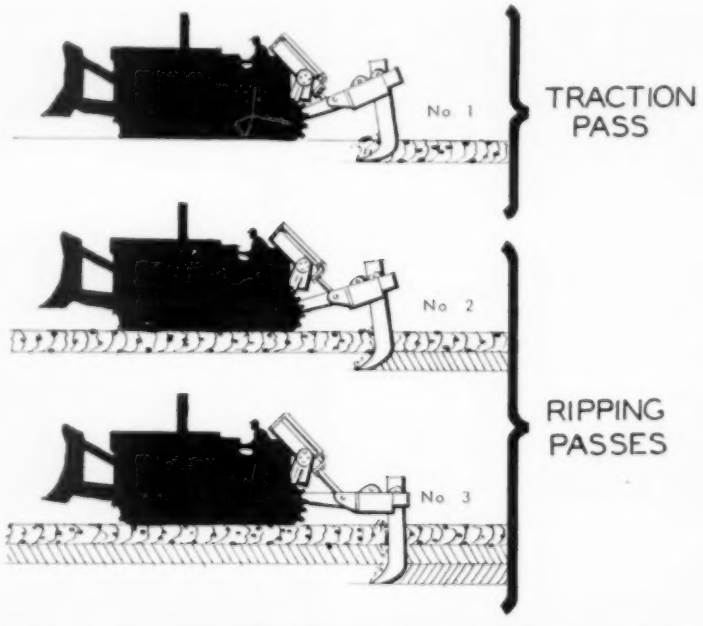
Even after it is shot, the overburden is often unwieldy and hard to handle, breaking off in large chunks. The time that must be taken to wrestle these pieces into haul units slows the entire operation, raising costs.

During testing, in the toughest materials the Mesabi had to offer, with frost running over five feet deep, the tractor-ripper was able to produce smaller pieces, faster and cheaper than shooting.

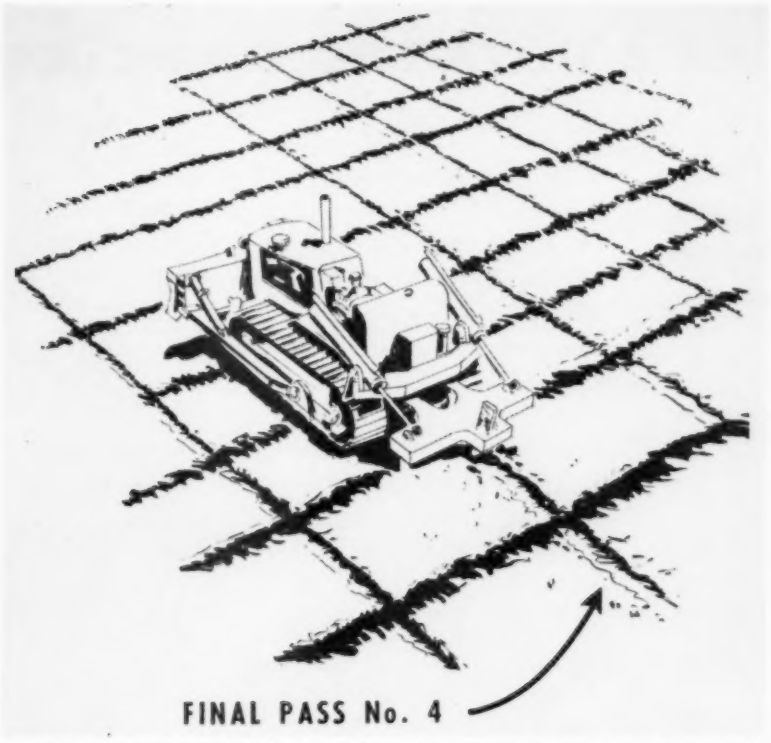
Mounted rippers, unlike towed rippers, are fastened to the back of large crawler tractors and become a part of the tractor. The combination makes it possible for the great weight and traction of the machine to be fully utilized. By concentrating more than half the total machine weight on one point—the tooth tip—the mounted ripper penetrates even the most stubborn materials. The D9 tractor with Kelley ripper used on the Mesabi weighed close to 90,000 pounds and developed over 63,000 pounds maximum pull at the tooth tip. This force pulls the tooth through the overburden causing it to crack the frost then shatter it into small pieces.

During the testing program on the Mesabi range, two types of overburden, that represent extremes in ripping conditions, were encountered. "Paint rock" is a slate-like, non-abrasive red rock, representing the most ideal conditions for fast, efficient frost ripping. The toughest ripping was in a sandy boulder-strewn clay. Although this frozen clay was the most difficult material encountered, it was handled at less than half the corresponding cost for drilling and blasting.

At one pit, in a heavily-bouldered area containing 4,635 square feet of sandy clay frozen to a depth of five feet, the tractor-ripper did its job for three cents less per cubic yard than the cost of powder alone. Calculated costs to drill and shoot the same material were $416, including labor, drills, caps and powder. Time estimates for the crews were 7.4 man shifts to drill and blast. In only eight hours the tractor-ripper had done a thorough ripping job of the area. Cost: $173, including depreciation, fuel, labor, projected repairs and maintenance. At that rate in the toughest conditions encountered during



In the ripping process, the tractor first makes a preliminary pass with slight penetration to loosen the surface. With better traction resulting, it then makes a series of passes, lowering the tooth deeper each time until maximum penetration is reached.



Here is how cross-ripping is done on 4-ft. centers. Several passes have been made with the ripper in the direction to the upper right corner of illustration. A final pass is made at right angles to the first to take advantage of newly created weak points.

testing, the ripper saved $243 per day, for 42% of the total cost of shooting and would have paid for itself in 255 days' work.

In ideal conditions in paint rock, the tractor-ripper broke the 4-ft. deep frost in the test area for 11.2% of the estimated drilling and blasting costs. The estimated expense to drill and shoot the 18,000 square feet of paint rock area was $1,551, including 26 man shifts per day. In only one shift, eight hours' time, the tractor-ripper had completely ripped the 18,000 square-foot test area. Total cost: $173, a difference of $1,378. At that rate, the tractor-ripper could pay for itself in only 45 days. Powder costs alone for this job were calculated at 27 cents per cubic yard; ripping costs were seven cents per cubic yard!

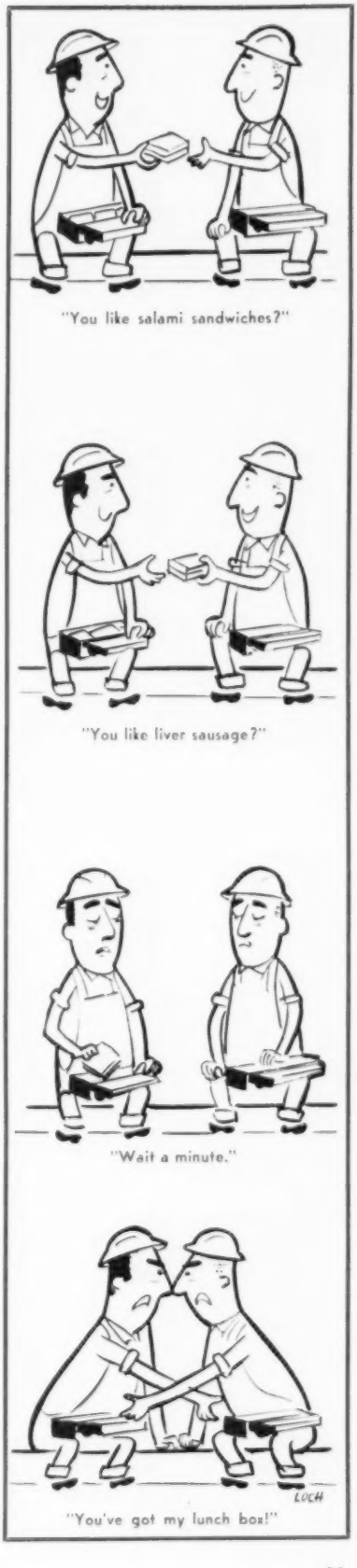
Utility Ripping

Another economy feature of the tractor-ripper which showed up during the Mesabi work was its ability to double in utility jobs when not on a production assignment. At one mine, the unit built a road through a frozen ore pile to a wrecker shed. A few hours before, a tractor without a ripper had tried the same job and couldn't dent the material with its bulldozer. The road assignment was finished by the tractor-ripper between production jobs.

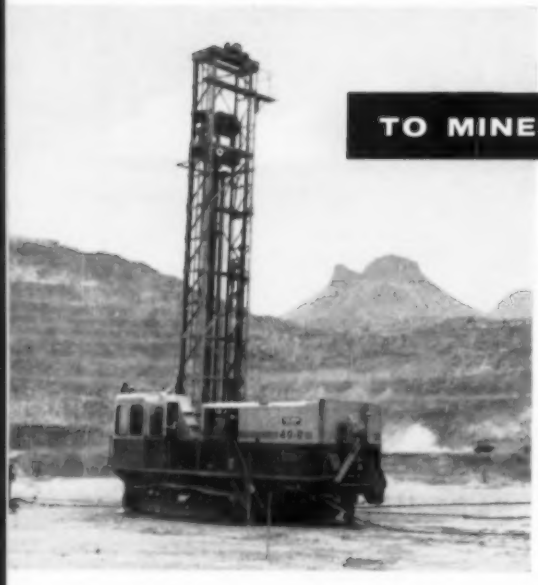
Although production ripping offers the greatest opportunity for continuous savings, "utility" ripping can result in spectacular savings when the need arises. For example, a quick utility ripping assignment was encountered by a mining firm when it started to construct a railroad grade crossing. The D9 tractor and Kelley ripper moved to the job, ripped out the frozen road surface to a depth of several feet, dozed the area to grade and moved back to its production ripping assignment—all in eight hours.

The principal advantages of the tractor ripper on this job were its speed —two hours to construct the grade crossing—and its ability to complete the job alone with a minimum interruption of traffic, without the expense of shooting.

Because it extends the working season by allowing construction crews to work when frozen ground would normally stop them, the tractor-mounted ripper offers contractors a chance to lower costs. Additional benefits are gained by the unit's ability to double in utility work. Use of this modern earthmoving tool offers outstanding possibilities for reducing today's high operating costs.



BUCYRUS-ERIE ROTARIES BRING NEW



Drilling 9-in. holes at an open pit copper mine, this Bucyrus-Erie 40-R puts down five times as much footage as cable tool drills previously used. To speed progress at this location, the 40-R drills continuously for the full length of the drill pipe — 27 ft. 9 in. (The larger 50-R drills continuously for 32 ft. 9 in.)

In blast hole operations from coast to coast, Bucyrus-Erie rotaries have revolutionized drilling. The jobs pictured here are examples of the kind of performance owners everywhere get with Bucyrus-Erie rotaries. Check the job data carefully. See how important Bucyrus-Erie rotary features contribute to top output.

These advantages can speed *your* drilling progress, too. Write us today for illustrated bulletins on the 40-R (full-electric or diesel-electric power) for drilling 6¾ to 9-in. holes, and the 50-R (full-electric only) for drilling 9⅞ to 12¼-in. holes. 75858C

BUCYRUS ERIE

A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY
Drill Division
U.S. Highway 40 West, Box 324, Richmond, Indiana

In a Canadian open pit iron mine this 40-R is responsible for new drilling economy. When moved to this location, it cut drilling costs per foot of hole by more than 50%. One of the features that contribute to the 40-R's fine performance at this mine is air bailing of cuttings. Compressed air cools the bit and cleans out cuttings, eliminating the need for water — especially important during cold weather. Heavies pile up adjacent to the hole, provide handy stemming material, and permit dry sampling.

The first 50-R placed in operation at this open pit coal mine in Ohio increased drill footage so substantially that three other 50-Rs were added. Here and in softer formations, the operator can increase rotating speed substantially as he cuts down pressure. He can match pulldown force and rotation speed so tools do not advance faster than cuttings are removed. At the same time, he keeps up enough air velocity to remove cuttings from the hole.

DRILLING ECONOMY. . .

The 40-R shown here at a Pennsylvania quarry was brought in to drill difficult formations — quartzite segmented by fissures and seams. This rig improved footage so greatly that it was placed permanently at this location. When drilling these hard formations, the operator can exert maximum down pressure on the bit while the drill pipe is turning slowly. This gives greatest possible penetration.

TO QUARRIES

This 50-R drill is so fast that it was able to replace two cable tool rigs and a rotary that had been working full time at a California cement quarry. Due to the fine performance of the 50-R at this quarry, a smaller 40-R was added to the production team. Manual effort is reduced to a minimum on these Bucyrus-Erie rotaries: a remote-controlled power-driven drill pipe rack adds or removes the drill pipe. Any one of four pipes can be moved into position over the hole and screwed tight by power. The rack also stores pipe not in use.

TO CONSTRUCTION PROJECTS

On a section of the main ship canal between the Victoria and the Jacques Cartier bridges directly opposite Montreal's harbor, this 40-R is shown drilling blast holes. Material drilled at this portion of the Seaway consists mostly of black shale with bands of very hard igneous rock. The 40-R can move up or down a grade of approximately 30% with the derrick up or down. Crawler units are chain-driven from the propelling machinery. Each crawler is independently controlled by an air-operated friction clutch and band brake.

News from the Field

AMC Elects Salvati

Raymond E. Salvati has been elected president of the American Mining Congress. Salvati is president of Island Creek Coal Co., Huntington, W. Va. He succeeds Howard I. Young, president, American Zinc, Lead and Smelting Co., St. Louis, Mo. The AMC held a two-day session in New York City in December.

The Mining Congress, which represents all branches of the mining industry, maintains its headquarters in Washington, D. C. It has promoted modernization and mechanization of mines and has recently completed its 60th year.

Elected as vice presidents were Andrew Fletcher, president, St. Joseph Lead Co., New York; Herbert C. Jackson, associate managing partner, Pickands Mather & Co., Cleveland, Ohio; and Clyde E. Weed, chairman of the board, The Anaconda Co., New York. Julian D. Conover, Washington, D. C., was re-elected executive vice president and secretary.

Howard I. Young, the outgoing president of the Mining Congress, had served as its chief executive for 25 years.

The incoming president, Raymond E. Salvati, has been active in the AMC for many years. A graduate of West Virginia University, he rose from a trackman to president of the nation's third largest producer and distributor of bituminous coal.

The following mining executives were elected directors for a three-year term: Merl C. Kelce, president, Peabody Coal Co., St. Louis; F. S. Mulock, president, U. S. Smelting Refining & Mining Co., Boston, Mass.; Charles J. Potter, president, Rochester & Pittsburgh Coal Co., Indiana, Pa.; H. A. Sawyer, president, Lone Star Cement Corp., New York; Albert E. Seep, president, Mine & Smelter Supply Co., Denver, Colo.; Merrill E. Shoup, president, Golden Cycle Corp., Colorado Springs, Colo.; Harrie S. Taylor, president, Oglebay Norton Co., Cleveland.

Vice president Clyde E. Weed and outgoing president Howard I. Young also were named to the board.

Ellery Sedgwick, Jr., president, Medusa Portland Cement Co., Cleveland, was elected a director for a one-year term to fill an existing vacancy.

Mobile Asphalt Plant

A. Teichert & Sons, Sacramento, Calif., mix and load asphalt in an unusual plant setup. The operation is completely mobile and the entire plant, which is operated by five men, can be broken down and moved to another location within 24 hours.

This arrangement, in which the asphalt tanks are located above ground, is new in the construction industry. Conventional methods call for asphalt storage tanks to be buried in the ground—the ground being used as insulation.

Three mobile tank trailers of 12,000-gallon capacity which are insulated with 4 inches of ultralite fiberglass serve to store the asphalt. They are heated by electrodes which run the full length of the tank. A Fruehauf stainless steel van, which also contributes to the mobility of the unit, is used as a control center for the entire operation.

Scale-Model Payhauler

International's model 95 Payhauler end-dump now is available in a sturdy scale model that can be used both for decorative purposes or as a toy.

The large, durable die-cast model is more than 18 inches long, almost 9 inches high and 8¼ inches wide. Its shipping weight is 8 pounds.

The die-cast aluminum body and cab are mounted on a rugged metal chassis supported by six giant-size rubber tires. The model boasts a working hydraulic lift body and spring guide steering.

The color scheme of the miniature Payhauler is International Harvester's new federal yellow, the color recently adopted for all International construction equipment.

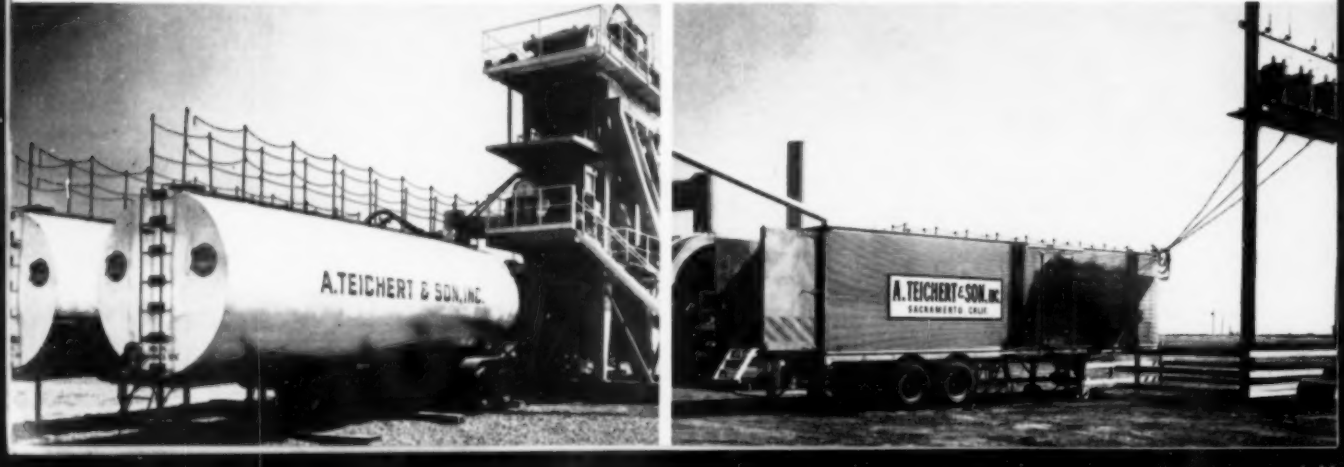
Models are now available at all International Harvester construction equipment distributors.

ARBA Slates Convention

At age 57, the American Road Builders' Assn. is still young enough to respond to new ideas. The program for

Continued on page 44

(Left) Mobile asphalt plant has 12,000-gallon insulated tanks mounted on trailers. (Right) A 35-ft. van is control center.



Sauerman DragScraper Digs and Hauls from Pit to Hopper for 8¢ Per Yard

Robert Wilson, Sr., president; Bob Wilson, Jr., treasurer; and Kent Wilson, vice president—Wilson Sand Co.

Track Cable DragScraper inhauling load to hopper from 40 ft. below water.

DragScraper and carrier returning to pit by gravity. Average haul is 500 ft. on a 675-ft. span.

Operating costs for Wilson Sand Co.'s new Sauerman DragScraper are estimated to be less than 8 cents per yd. This includes labor, maintenance and power costs to dig from 40 ft. below water level and deliver 90 yds. per hr. to the field hopper on an average haul of 500 ft.

Wilson Sand Co.'s new 125-tph. plant represents a steady increase in capacity which started with 20 tph. in 1939, using a small Sauerman Slackline.

Sauerman equipment has kept pace with the growth of their Upper Sandusky, Ohio plant. The Slackline was replaced by a 1½-yd. track cable DragScraper in 1951, and with a 2-yd. machine in 1953. The new Sauerman unit is a 3-yd. track cable DragScraper operated by a two-drum electric hoist equipped with air controls.

The DragScraper is digging 35 to 45 ft. under water down to bed rock on a 675-ft. span. The pit bank stands 40 ft. above the water, thus total depth of the deposit recovered by the DragScraper is about 85 ft.

Excellent material and the right equipment to dig and process are responsible for the continued growth of the Wilson Sand Co. Officers of the company are Robert W. Wilson, Sr., President, Kent Wilson, Vice President and Bob Wilson, Jr., Treasurer.

You can cut *your* costs by digging and hauling with a Sauerman Machine sized to match your plant capacity. Track cable Drag-Scrapers dig from high banks, dry pits and deep water. They are built in sizes up to 15 yds. and operate economically on 1000-ft. spans. Start reducing your operating costs—write or call and tell us your job requirements.

After discharging load into field hopper, DragScraper is lifted from pile for return to pit. Conveyor at left leads to plant.

This Sauerman two-drum hoist controls operation of DragScraper.

SAUERMAN BROS., INC. 622 SO. 28th AVE. BELLWOOD, ILL.

Linden 4-4892 • Cable CABEX—Bellwood, Illinois

Crescent DragScrapers • Slackline and Tautline Cableways • Durolite Blocks

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Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

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BEST BUYS IN NEW AND USED EQUIPMENT

News . . .

Continued from page 42

ARBA's 57th annual convention, to be held in Dallas, Tex., Jan. 19–22, has been enlivened with new features, all aimed at giving the conventioneer a stimulating meeting.

None of the ideas is revolutionary in itself. Most of the "new wrinkles" resulted simply from applying new thinking to the old formats. The Road Builders think their meetings will not only be more enjoyable, but will also have more lasting value.

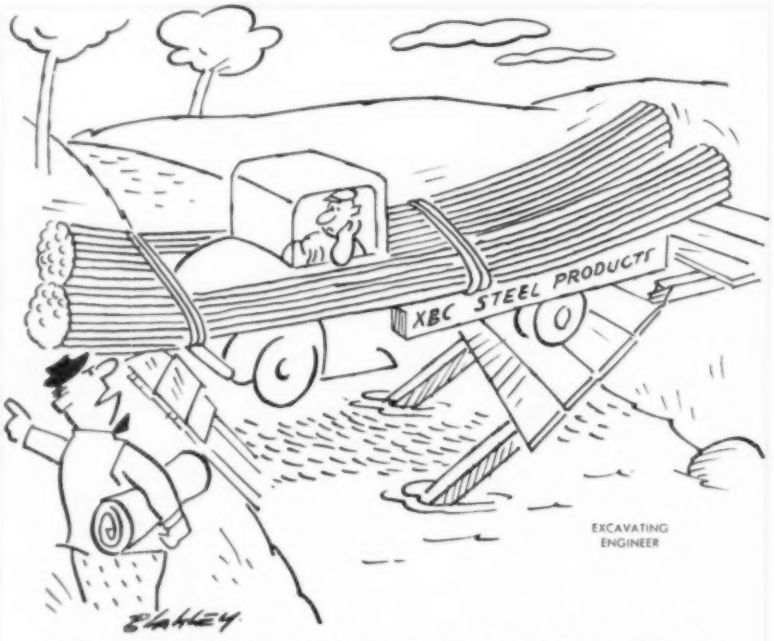
The entertainment schedule has undergone a face-lifting too. A highlight will be the Texas "Round-Up and Chuck Wagon Barbecue," when the huge Dallas Memorial Auditorium will be transformed into a piece of Texas range for an affair that will be unique in ARBA history. Other big social events include the President's Reception, with a special preview of the 5th Annual Materials and Services Exhibit, and the traditional Road Builders banquet. Many delegates will cap the climax by participating in a post-convention conducted trip to Mexico.

The highway industry will take particular interest in the convention resolutions, which will chart ARBA's course of action in many areas of vital importance to the road building program.

For example, ARBA has again invited leading congressmen in highway affairs to come to the convention. But this time, the congressmen will forego the standard oratorical stance in favor of participating in a brass-tacks discussion of highway issues. Included in the forum will be Sen. Dennis Chavez of New Mexico, chairman of the Senate committee on public works; Sen. Francis Case of South Dakota, the committee's ranking minority member; Congressman George H. Fallon of Maryland, chairman of the House subcommittee on roads, and Congressman Hale Boggs, veteran member of the House ways and means committee.

The list of speakers includes a prominent new face, that of Ellis L. Armstrong, new commissioner of public roads. Convention delegates will also hear addresses by Federal Highway Administrator Bertram D. Tallamy, Executive Secretary A. E. Johnson of the American Association of State Highway Officials, and Fred F. Florence, president of ARBA's banking and financing division and chairman of the executive committee of the Republic National Bank of Dallas.

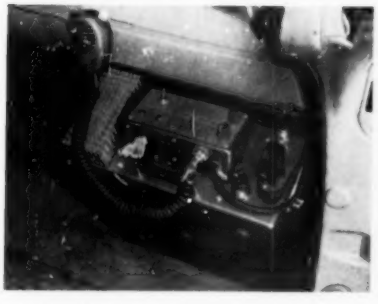
As it applies to technical sessions, the "new look" puts strong emphasis on quality, as opposed to quantity. No more than two technical sessions will be scheduled in the same time slot, with special pains being taken to be sure that every session is centered around a topic of general interest and that the speakers will be the top experts in their fields.



"I don't give a dam about your troubles, we need those reinforcing bars right now!"

Equipment You Ought to Know About

Transistor-Powered Mobile Radio



Manufacturer: Communications Products, Department EE, General Electric Co., Syracuse, N. Y.

Claims: New two-way radio equipment introduced by General Electric contains transistor power for both transmitter and receiver. The units are available either for mounting in the front of a car or truck (as shown) or for placement in a vehicle's trunk. General Electric transistor-powered designs may be used in low band frequencies (25 to 54 mc), high band (144 to 174 mc) and UHF (450 to 470 mc).

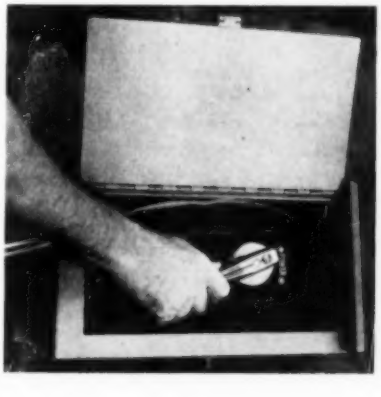
Blasting Switch

Manufacturer: Atlas Powder Co., Department EE, Wilmington 99, Del.

Claims: Improved timing accuracy of delay electric blasting caps connected in parallel circuits can be achieved with the new Atlas Arcmaster blasting switch. The switch is designed to eliminate erratic timing often associated with gasless-type "long-period" (half-second intervals) delay electric blasting caps as a result of arcing caused by the continued application of excessive electric current.

The switch was designed primarily for tunnel work, where straight parallel blasting circuits are almost universally used. However, it should prove useful in any situation involving parallel circuit standard delay blasting. It is said to vastly improve delay timing and substantially reduce the possibility of misfires.

Essentially a time limiting switch, the Atlas Arcmaster employs a load-type circuit breaker to limit the duration of the application of electric current to the blasting circuit to .025 to .030 of a second. It is designed for use with 440 and 220-volt power sources. The switch is housed in a steel case and is sturdily constructed and designed for heavy-duty service.



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Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.
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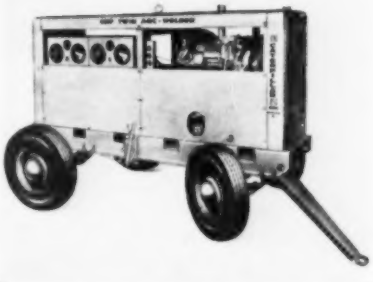
DRAGLINE BUCKETS

Twin Arc-Welder



Manufacturer: Engine Div., Department EE, Caterpillar Tractor Co., Peoria, Ill.

Claims: A new, portable Twin Arc-Welder, equipped with either skid base or running gear, uses the Cat D311 (Series H) diesel engine and two Lincoln electric welding generators.

The generators each have a rating (NEMA) of 300 amps at 40 volts for simultaneous operation of two arcs. For parallel operation the Twin Arc-Welder is rated at 600 amps, 40 volts. The current range of each generator is 60 to 375 amperes.

Two sets of generator controls allow

Continued on page 46

Three Faces of Crippling

Birth Defects Arthritis Polio

JOIN THE
MARCH OF DIMES
TOWARD GREATER VICTORIES

New Equipment . . .

Continued from page 45

welding at different voltages, amperages and polarity at the same time to permit precision adjustment for any type or size arc throughout the current range.

A 3-kw capacity exciter provides a constant source of magnetic flux to the generators and 1.5 kw or more of power to two 115-volt DC auxiliary equipment outlets.

Adequate engine reverse capacity assures a constant arc without fluctuation due to normal load variations. The engine is a Cat D311 (Series H) four-cycle, four-cylinder, valve-in-head precombustion chamber diesel.

The standard Twin Arc-Welder includes 24-volt electric starting complete with charging generator and batteries, instrument panel and base-type fuel tank. Welding cables are not included since most owners already have them. Other than the cables, fuel and water, the welder is ready to start working upon delivery.

Heavy-duty, four-wheeled running gear with springs and mechanical parking brake is available. This unit is 66.1 inches high with a 90.8-in. wheel base and a 60-in. gage.

The standard unit with skid base is 116 inches long, 31.2 inches wide and 51 inches high. Two units (power for four welders) are easily mounted on one truck. Approximate weight of the standard machine is 4,035 pounds.

The D311 (Series H) Twin Arc-Welder replaces the D315 model in the Caterpillar line providing the same output with smaller dimensions and lower cost.

Industrial Locomotives

Manufacturer: Rogers Brothers Corp., Department EE, Albion, Pa.

Claims: After three years of development by locomotive design engineers during which numerous units have been delivered, Rogers Brothers has announced it will design and build locomotives for all industrial uses.

Efforts at present will be devoted largely to the custom designing and manufacture of diesel-hydraulic and diesel-electric locomotives in 5-ton to 40-ton sizes and track gauges from 21 inches to 56½ inches.

Each locomotive embodies a powerful high torque diesel engine, an efficient torque converter and a power shift transmission which makes manual shifting unnecessary.

This combination delivers high tractive effort, continually, across the entire working range with powerful acceleration for ease in switching.

Advanced controls that are uncommonly convenient, responsive and safe permit operation by unskilled workers.

The locomotives are of modern design with cabs and main frames completely electrically welded. Ventilating windows in the cabs offer uncommon visibility in all directions.

A complete line of related accessories is available, including a patented, newly-designed fume scrubber to adapt the locomotives for use in buildings, tunnels and other confined areas.

Shrouded Rigging Block

Manufacturer: Sauerman Bros., Inc., Department EE, 622 S. 28th Ave., Bellwood, Ill.

Claims: Sauerman Durolite blocks are now available with shrouded housings to insure proper seating of the running rope. The shrouds help prevent the rope from binding at the throat of the block, thus reducing breakage and cable wear.

The shrouds are especially recommended where blocks must operate in a horizontal plane and there is a tendency for the rope to leave the sheave grooves.

Shrouded blocks have a wide application in rigging work and in the mining field. They are made of the same high alloy steel used on the Durolite block frames to maintain the combination of durability with lightweight.

1¼-Yd. Excavator

Manufacturer: Baldwin-Lima-Hamilton Corp., Construction Equipment Div., Department EE, Lima, Ohio.

Claims: Two new additions to the Lima excavator line are designated as types 64 and 64-SC. Both machines are equipped with air control.

The type 64 has a rated capacity of 40 tons when equipped as a crane. When equipped as a shovel, it has a 22-ft. boom, 17-ft. dipper handle and 1¼-yd. dipper. Change-over from shovel to

Continued on page 50

Everybody profits ...because

you belong

in this picture!

The publisher of this magazine is often asked what kind of a man you are . . . and how many like you are receiving his magazine.

Why is he asked?

Because the *advertisers* (whose money is his chief income) insist upon knowing the types of people (by industry or profession, by title) for whom the magazine is edited — and how many are getting it.

In order to standardize on the presentation of such information to advertisers and to have its accuracy vouched for by a disinterested third party, nearly 450 publishers have joined some 200 leading advertisers and advertising agencies in a non-profit organization called Business Publications Audit.

The purpose of BPA is to assure advertisers . . . by frequently checking and rechecking . . . that each member publisher is indeed distributing his magazine, in the *numbers* promised, to the *types* of men he promised would receive it.

The BPA symbol in this magazine means that *you belong* . . . that because of your occupational interests you are qualified, in the eyes of the advertisers, to receive it.

The advertiser can thus tell whether he's getting his money's worth.

The publisher has a better sales story to prospective advertisers because his magazine is "audited."

And you, the reader, get more value from the magazine because both the advertisers and editors, knowing what your special occupation is and what your interests are, are better able to prepare advertising and editorial material that will be most informative and useful to you.

What you can do

Publishers and advertisers frequently write to magazine readers to learn what kind of articles and advertisements appeal most. Cooperate with them — will you? — by answering their questions . . . in the interest of better communications between makers and markets.

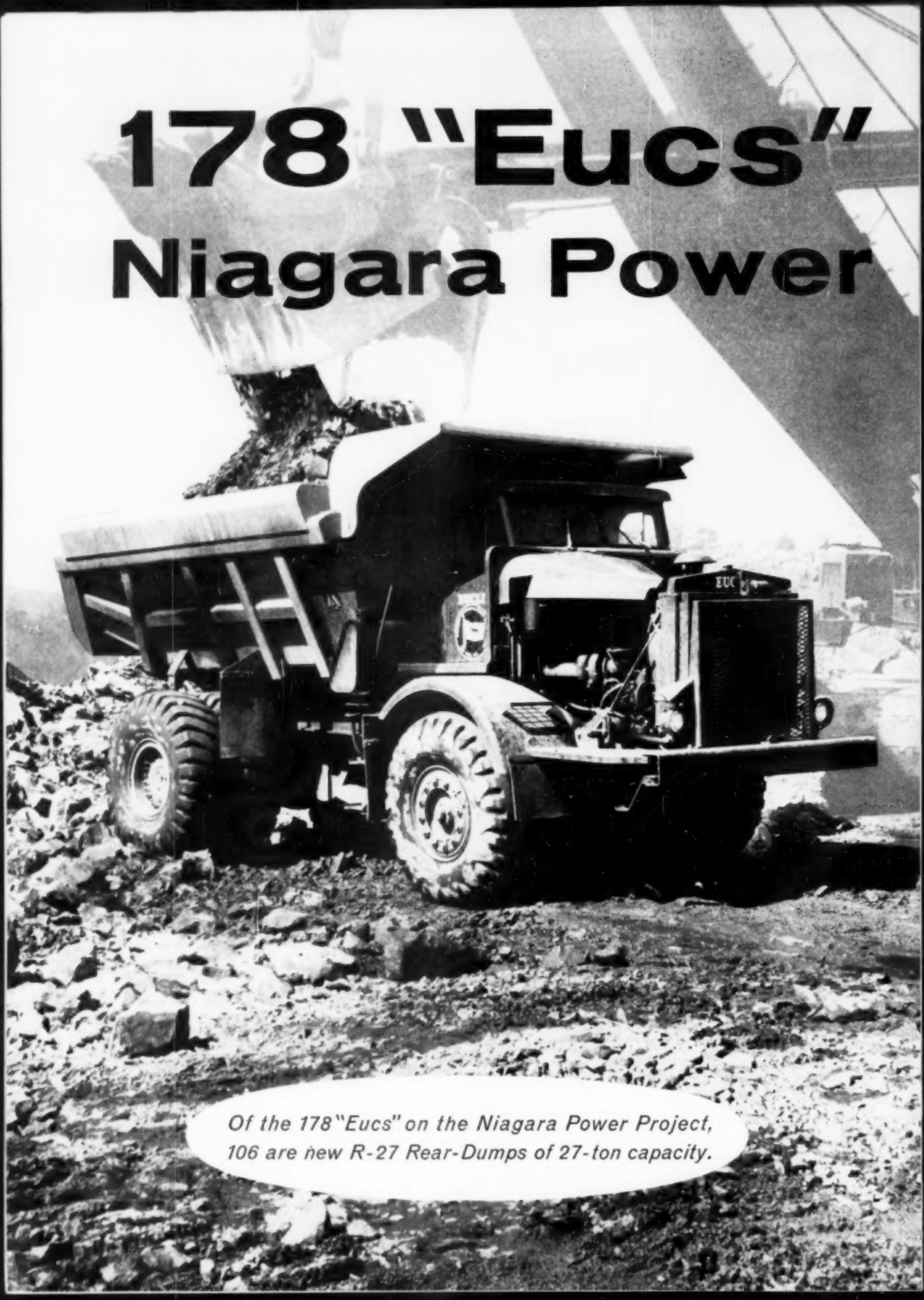
BUSINESS PUBLICATIONS AUDIT OF CIRCULATION, INC.

420 Lexington Avenue New York 17, N. Y.

BPA

A NON-PROFIT, TRIPARTITE MEMBERSHIP CORPORATION OF ADVERTISERS, ADVERTISING AGENCIES AND BUSINESS PUBLICATIONS

178 "Eucs"
Niagara Power



Of the 178 "Eucs" on the Niagara Power Project, 106 are new R-27 Rear-Dumps of 27-ton capacity.

Working on the Project

Gull Contracting & L. G. Defelice are using 36 of these 27-ton "Eucs" on their 4½ million yd. channel excavation work.

"Twin" Scrapers in the Euclid fleet of Channel Constructors help remove overburden from rock that will supply the big aggregate plant.

Balf-Savin-Winkelman have Rear-Dump and Bottom-Dump "Eucs" in their fleet. Earth excavation for the two inlet channels is hauled in 12 bottom-dumps.

THE $625 million Niagara Power Project being constructed by the Power Authority of the State of New York is one of the world's greatest hydro-electric developments. When completed in 1962, the project will produce well over 2 million kilowatts of electricity from water that now flows unproductively over Niagara Falls . . . that's enough to supply the household needs of a city the size of Chicago —with over 3½ million population!

Consisting of five different sections, all phases of this tremendous job are now under contract. Although much of the work is still in the preliminary stage there are Euclids on every section — a total of 178 of them already! With many millions of tons of rock excavation to be moved, Rear-Dump "Eucs" predominate, but big Bottom-Dumps and "Twin" Scrapers are also being used. Contractors on 4 of the 5 sections have purchased a total of 106 new R-27 Euclids for their work. With 325 or 335 h.p. engine, 4-speed Torqmatic Drive, converter lock-up, and 18.00 x 25 tires all around, this new "Euc" moves 27-ton loads on steep grades and tough hauls.

These contractors are using "Eucs" on all 5 sections:

- **Merritt-Chapman & Scott Corp.** 64
- **Channel Constructors** 37
  (Peter Kiewit Sons Co., Perini Corp., Morrison-Knudsen Co. Inc., and Walsh Const. Co.)
- **Gull Contracting & L. G. Defelice.** 36
- **Edw. Balf Co., Savin Bros., D. W. Winkelman.** 41

Euclid equipment has proved its ability to maintain high production at low cost for over 25 years . . . on big, rush projects like this one and on smaller mining and construction operations, too. For reasons why "Eucs" are *your* best investment see your Euclid dealer before you figure that next job!

EUCLID
Division of General Motors Corp.
Cleveland 17, Ohio

New Equipment . . .

Continued from page 46

crane, dragline or hoe is easily made in the field.

The type 64-SC is designed for special crane service and has a rated capacity of 50 tons. Features and available equipment for crane service include power load lowering device; independent propel; hoist drum reversing device; third drum attachment; safety boom stop; and pin-connected boom of high strength alloy steel tubular construction.

The types 64 and 64-SC have identical truck bases. Two widths of axles and two lengths of crawler side frames are available. Standard crawler is 13 feet 3 inches long and 10 feet 8 inches wide with 30-in. treads. For special crane and dragline service, an extra long, wide crawler can be furnished.

A choice of gasoline, diesel or electric power is offered. Torque converters are available.

Curtiss-Wright Scrapers

Manufacturer: Curtiss-Wright Corp., South Bend Div., Department EE, South Bend, Ind.

Claims: Self-propelled and tractor-drawn scrapers, ranging in size from 7 cubic yards to 30 cubic yards struck capacity and rear dump models in sizes up to 35 tons capacity, are now being manufactured by the South Bend Division, marking the full scale entry of Curtiss-Wright into the construction equipment field.

Two new high-speed scrapers have been introduced by Curtiss-Wright. They are the model CW-226 shown below—a two-axle scraper with a struck capacity of 26 cubic yards and a heaped capacity of 36 cubic yards, and the CW-220, with a 20-yd. struck and a 27-yd. heaped capacity.

Both the CW-226 and the CW-220 are powered by a 375-hp GM 6-110T diesel engine through an Allison automatic transmission and torque converter,

"It's a toy any father can easily understand and comes already assembled."

which provides top horsepower at rated capacity and road speeds ranging up to 35 mph with full load.

One of the outstanding features of the two new units is Curtiss-Wright's exclusive "Roto-Gear" steer, a hydraulic steering system which provides constant torque throughout the entire steering cycle—instant response and fingertip control throughout the entire 180° steering arc.

To increase equipment utility, both the CW-226 and the CW-220 scrapers are interchangeable with a 35-ton rear dump unit which utilizes a Torqmatic brake for hydraulic retarding and control on steep grades.

The CW-226 and CW-220 incorporate a new "unit" design concept, for convenient access to major components and easy maintenance and service-less downtime on normal maintenance and repairs. A new front hinged "tilt-up" hood, secured with two quick-opening aircraft type latches, gives quick and easy access to the entire engine.

Other design features make for effective high speed earthmoving. A good bowl factor—up to 120%—is consistently obtained on jobs under widely varying conditions, through use of the adjustable angle, three-piece offset reversible cutting edge on the curved bowl.

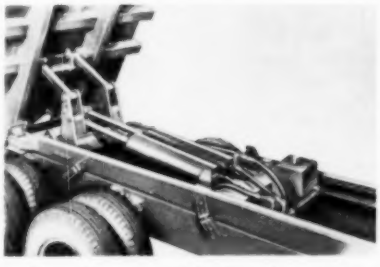
The units are engineered with correct weight distribution for greater on-the-job traction and mobility. For fast unloading the units have positive forward roll-out ejection and high apron lift.

Pneumatic Crane Hook

Manufacturer: Gar-Bro Mfg. Co., Department EE, 2415 E. Washington Blvd., Los Angeles, Calif.

Claims: The new Gar-Bro model B crane hook opens and closes pneumatically and is trigger actuated. A heavy-duty hook with a capacity of 12 tons, it is especially designed for handling 2, 3 and 4-cu. yd. concrete buckets and is also useful for other lifting work. The crane operator simply lowers the hook so that the mechanical trigger within the hook circle contacts the bucket bail. The bail actuates a ratchet-type air valve that controls the opening or closing of the hook. Overlapping lifting tongs provide an important safety factor; the hook cannot open under any load. Integral guide arms assure easy hooking. The need for a hook-on man is eliminated.

Hydraulic Truck Hoist



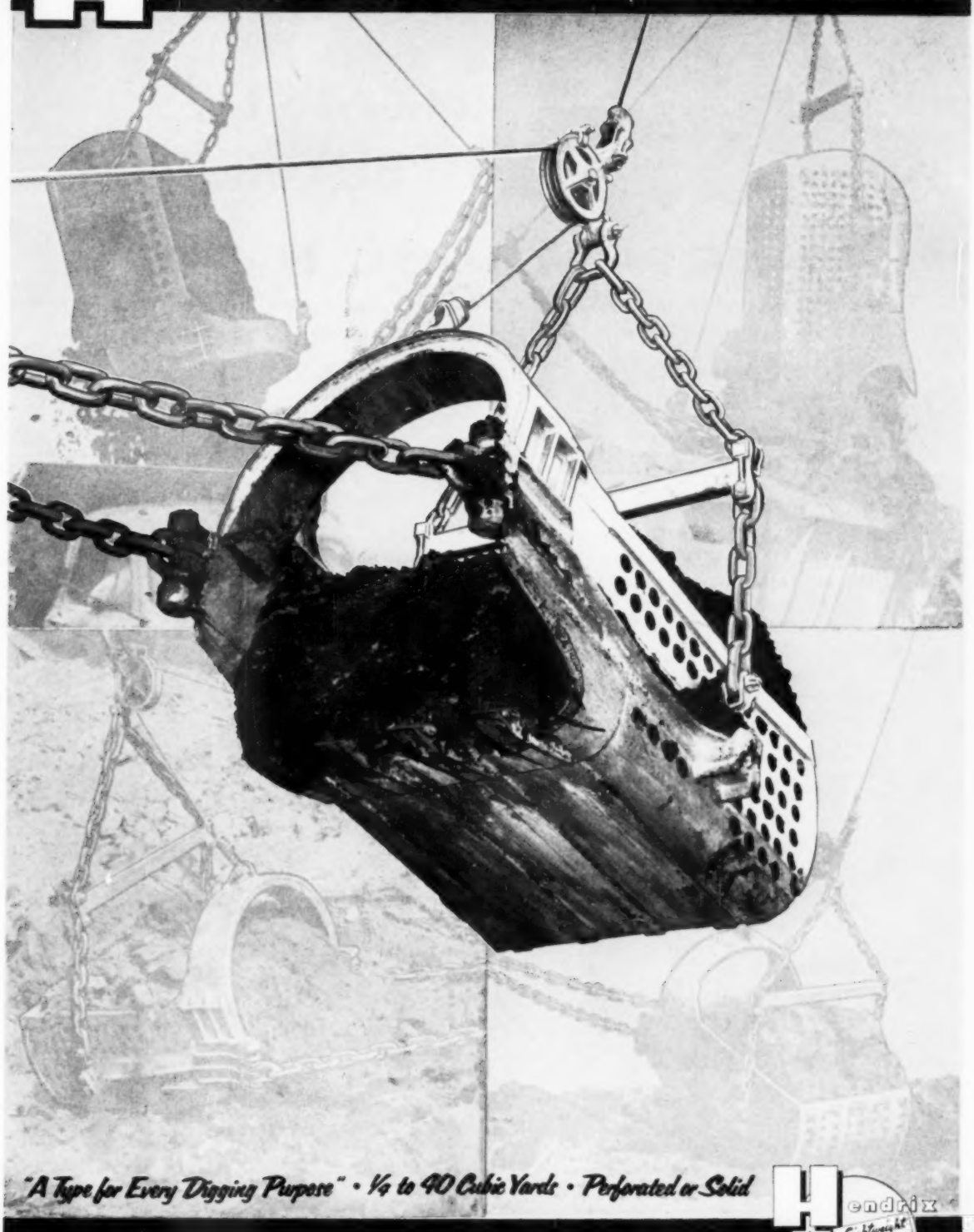
Manufacturer: Heil Co., Department EE, Milwaukee 1, Wis.

Claims: Heil has announced a heavy-duty truck hoist which will tilt a dump body to a maximum of 70°. The rugged unit incorporates a double-acting hydraulic system to power the body up, and also to pull down to where gravity takes over in lowering the body.

The hoist model is designated 2824 DA 70°-34. It is a twin-cylinder hoist, each cylinder being 8 inches in diameter and having a stroke of 24 inches. In addition to the double-acting feature, the hoist is of the double lift arm design which affords extreme stability to the dump body and truck during dumping

Continued on Page 54

HENDRIX DRAGLINE BUCKETS

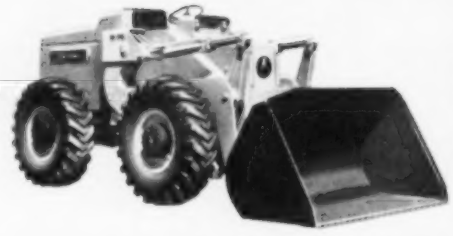


"A Type for Every Digging Purpose" • ½ to 40 Cubic Yards • Perforated or Solid

Hendrix Lightweight DRAGLINE BUCKETS

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA



It COSTS LESS To BUY the BEST

NEW MODEL H-90

GIVES YOU MORE VALUE FOR YOUR MONEY...MORE CARRY CAPACITY...MORE PERFORMANCE...MORE DEPENDABILITY

When it comes to investing money in equipment which must earn money, you can't afford anything but the best. Thousands of owners have found this to be true of the famous HO "PAYLOADER"... thousands more will find it even more so in the new, improved Model H-90.

Full 9,000-lb. Carry Capacity

You can lift loads up to 15,000-lbs., but you can CARRY LOADS up to 9,000-lbs. which means you can use buckets ranging up to almost 4 cu. yds., depending on the weight of the material. Because the bucket tips back 44° at ground level, you can carry 9,000-lb. loads closer to the machine and lower with better balance, stability, speed and less spillage. All excess "dead weight" has been eliminated and through balanced design, the H-90 can carry more pounds in the bucket than comparable machines weighing as much as 3,000-lbs. more.

More Powerful Breakout

A breakout force of 21,000-lbs., almost the entire weight of the machine, can be applied to the cutting edge of the bucket through unique pry-out pads. This enables you to get full bucket loads in the toughest digging.

Choice of Four Engines

The new H-90 gives you a choice of two gasoline engines and two diesel engines: either the 125 H.P. Hercules WXLC-3 or the 134 H.P. I-H U-450 in the gasoline, and the 122 H.P. Cummins JN-6-B1 or the 126 H.P. G.M.C. 4-71 in the diesel.

Extra Heavy-Duty Planetary Axles

Because tractor-shovels of this size and capacity are subjected to greater than average stresses and strains, the H-90 "PAYLOADER" planetary axles are special, extra heavy-duty type with power transfer differentials.

Full Protection for Long Life

The brakes of the front wheels are sealed to prevent scoring and glazing by foreign matter. Large oil-bath air filters and cartridge-type oil filter protect the engine. Two cartridge-type oil filters protect the hydraulic system oil and the transmission-torque converter oil.

Easy, Full-Power Operation

Power-shift transmission with three speeds forward and reverse, plus twin-cylinder power-steer and 4-wheel power brakes, assure fast operation with minimum operator effort... promote a high production rate the full shift.

More Attachments...More Uses

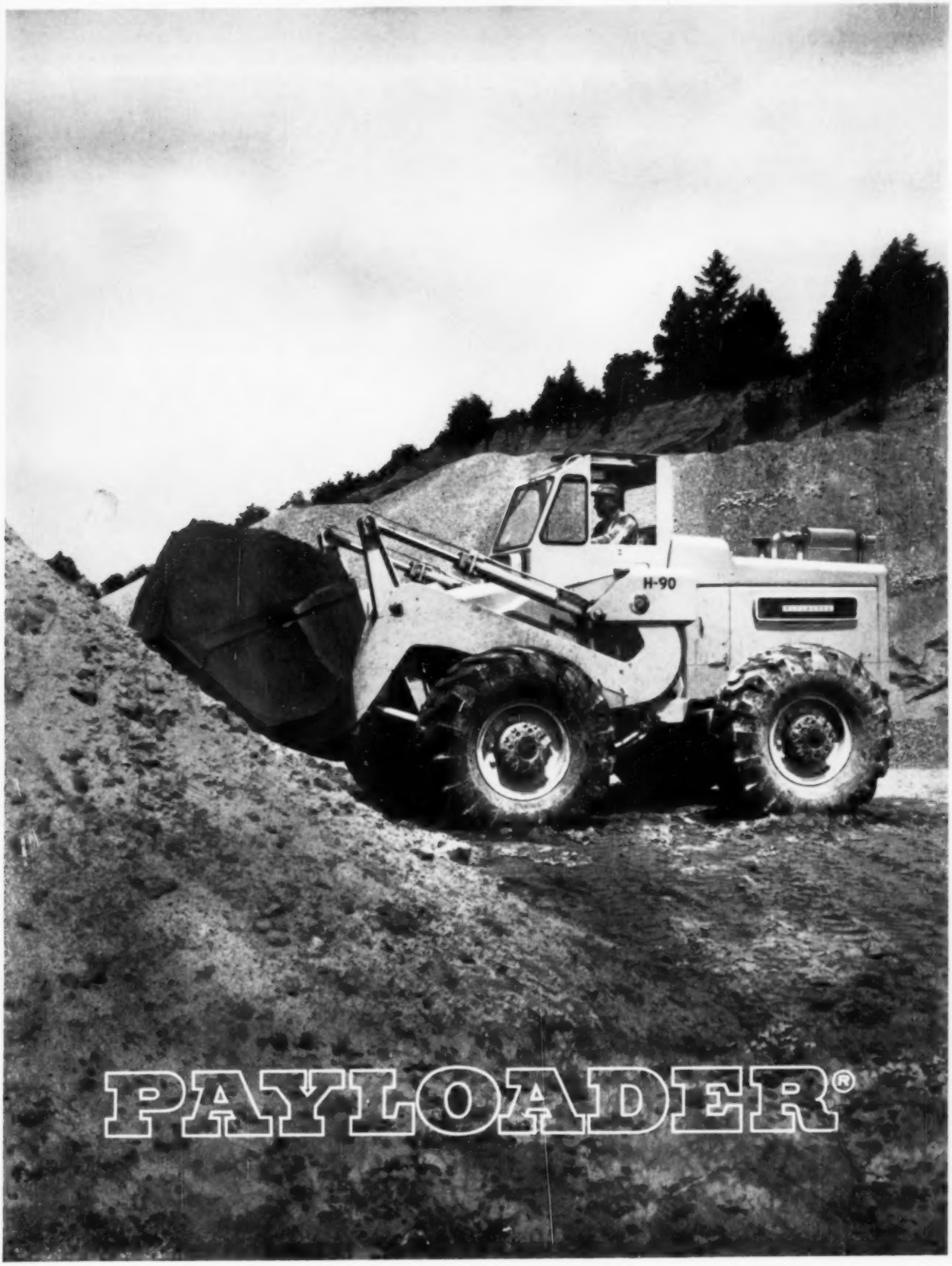
The widest choice of attachments are available, including these exclusive ones: Drott 4-in-1 bucket, Superior side-boom, Galion vibratory compactor, Ram black-top spreader... also blower, "V" and blade plows, angling back filler, scarifier, winch and others.

THE FRANK G. HOUGH CO. 1-B-1
708 Sunnyside Ave., Libertyville, Ill.
Send data on new Model H-90 PAYLOADER

Name _____
Title _____
Company _____
Street _____
City _____ State _____

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY


H-90
PAYLOADER®

New Equipment . . .

Continued from page 50

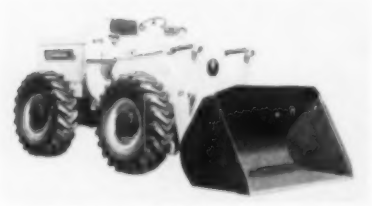
operations even when the truck is not on level ground.

The hoist is designed to fit any heavy-duty truck having a standard frame width, and is adaptable to both on-highway and off-highway excavating or mining operations. The 70° dumping angle which this hoist offers makes it particularly desirable for scoop-end rock bodies or quarry bodies. However, this hoist can also be used under conventional contractor bodies having tailgates. Many operators prefer this high dumping angle when hauling unusually "sticky" loads.

Another unusual feature of the unit is a pressurized hydraulic system which keeps the cylinder full of oil at all times and allows peak efficiency with a much smaller oil reservoir than units of this capacity normally require.

It is recommended that either Heil H-60 rock bodies or Heil H-11 heavy-duty contractor bodies be mounted on this hoist when used in heavy-duty dumping applications.

9,000-Lb. Capacity Loader



Manufacturer: Frank G. Hough Co., Department EE, 708 Seventh St., Libertyville, Ill.

Claims: Hough has announced a new rubber-tired, four-wheel-drive model, the H-90 Payloader. It replaces the former HO model.

The model designation of this new unit, like all recently introduced Payloader models, is based on the load carry capacity. In this instance it is 9,000 pounds at average travel speeds. Both gas and diesel power units are offered.

Buckets to handle materials of various weights within the recommended carry capacity of 9,000 pounds are available in sizes from 1½ to 5 cubic yards, S.A.E. rated bucket sizes.

An important feature provides the most noticeable change in the appearance of this new model. It is the "low-profile" front shroud which gives the operator improved visibility and makes for easier, faster and safer operation.

The H-90 has a breakout force of 21,000 pounds and a bucket tipback of 44° at ground level. The patented pry-out bucket action is exclusive on Hough rubber-tired loaders.

Like its predecessor, the H-90 has torque-converter drive, power-shift transmission and new heavy-duty planetary axles.

A cartridge-type oil filter has been built into the hydraulic reservoir, in addition to separate oil filters for both engine oil and transmission oil.

Power-transfer differentials which automatically transfer up to 24% more torque to the wheels with the best footing under slippery conditions, are another feature.

Improved steering results from the use of twin steering-booster cylinders. The H-90 has power-boosted brakes on all four wheels and sealed front brakes.

Balanced design of the new Payloader provides extra stability and safety. It permits faster operation with loads carried closer to the machine and lower to the ground. This makes possible the elimination of excessive dead-weight.

Mining Buckets

Manufacturer: Williams Bucket Div., Department EE, Wellman Engineering Co., 7000 Central Ave., Cleveland, Ohio.

Claims: A new group of heavy-duty mining-type dragline buckets has been added to the Williams line.

Built in 3, 4, and 5-yd. sizes, all buckets have arch and lip made from heat-treated T-1 steel for superior strength and wearing qualities. Chains are of heat-treated forged alloy steel.

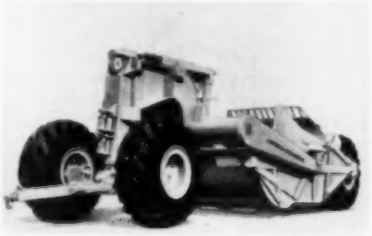
The 3-yd. model weighs in at 6,700 pounds compared with the standard 3-yd. Williams dragline bucket which weighs 5,875 pounds. The new 5-yd. model weighs 11,000 lbs.

Other features of the standard line, including full-length patented welded stiffeners, reversible manganese alloy steel teeth and adjustable hitch connections are all retained. All wear points are protected by skid bars and wear plates.

Over-all widths range from 6 feet 1 inch to 6 feet 9 inches. Lengths of the new line range from 20 feet 4 inches for the 3-yd. model to 28 feet 8 inches for the 5-yd. size.

Like all Williams buckets, the new models are also available perforated for wet service.

Bigger Fullpak Scraper



Manufacturer: LeTourneau-Westinghouse Co., Department EE, Peoria, Ill.

Claims: The struck capacity of the LeTourneau-Westinghouse BT Fullpak scraper has been increased from 18.7 to 21 cubic yards. Heaped capacity of the unit is 27 yards.

The BT Fullpak, largest tractor drawn scraper in the LeT-WesCo line, is designed for use with tractors of 150-hp or more.

Boosting the capacity of the scraper by nearly three yards was accomplished by making only minor changes, say LeTourneau-Westinghouse engineers. They point out that the modifications in no way disturb the easy loading characteristics of the Fullpak design.

The BT Fullpak features a broad smooth bowl interior free from obstructions. This smooth, clean design minimizes friction and loading resistance. An important feature is the extremely flat position of the bowl floor—only a 1° tilt when in loading position. As a result, material slides in easily without having to travel "up-hill" to get into the bowl.

An additional aid to getting full well-packed, low-void loads is contributed by the precisely curved tailgate and anti-spill grid which promotes a full rolling, boiling action.

The BT's positive acting tailgate combined with a more than 7-ft. apron lift, forces big loads to flow out of the bowl as easily as they go in.

Contractor for Glen Canyon Bridge: Kiewit-Judson Pacific-Murphy Corp. in a joint venture.

Bold New Bridge Spans the Mighty Colorado. At Glen Canyon, near the Arizona-Utah frontier, a great steel bridge will soon carry north-south traffic over the Colorado. The bridge is a brilliant feat of engineering. Anchored in sheer canyon walls far above the river, it is the country's highest and second-longest steel arch span.

Lower chords are tied into skewbacks on opposite sides of the canyon. As steelwork progressed from two directions toward the closure point, Bethlehem 1½-in. bridge strand was used to hold the arches in position. These strong wire cables were run to the upper chord members from big tieback towers, which themselves were securely guyed by Bethlehem strand. This system of tiebacks and guys proved an effective means of supporting the steel segments as they thrust out into space.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

NOT in the Contract

"And remember, my friends," the lecturer told his audience, "there will be no buying and selling in Heaven. . . ."

"That," mumbled a businessman at a back table, "is not where business has gone."

A tomcat and a tabby were doing some courting on the back-fence. The tomcat leaned over and whispered, "I'd die for you!"

The tabby gazed at him through lowered eyelids and purred, "How many times?"

The pretty young teacher was explaining the difference between abstract and concrete.

"Concrete means something you can see," she told the children, "and abstract means something you can't. Now who will give me an illustration?"

Little Tommy in the first row was the first to hold up his hand.

"My pants are concrete," he said. "Yours are abstract."

Two Hollywood children were talking as they were walking home from school one day.

"I've got two little brothers and one little sister," boasted one. "How many do you have?"

"I don't have any brothers or sisters," answered the second one, "but I have three papas by my first mama and four mamas by my last papa!"

Sign in hotel equipped with sprinkler system:

"Don't smoke in bed. You may drown yourself."

"They're tranquilizer pills."

When Rastus came to call on Mandy she donned, for the occasion, her new chemise dress. Rastus's eyes bugged out as he said: "Honey, I got only one question to ask: Is yo' in style or is I in trouble?"

Her husband returned home unexpectedly. A pair of shoes were on the floor and the sight sent him into a blazing fury. Picking them up he looked at them, compared them with his worn shoes and then his anger subsided.

"For a moment I was going to tear down the house," he said to his wife. "I thought the maid had forgotten to put my shoes away, but I see these are not mine."

The farmer's barn had just gone up in smoke, and his insurance agent was trying to explain why he couldn't collect cash for it.

"Read the policy," he insisted. "All our company engages to do is build you another barn exactly like the one that's destroyed."

"Well if that's the way you varmints do business," raged the farmer, "you can cancel the policy on my wife."

"Yes, it sure is," said the little girl, as she answered the phone and hung up.

"Who's that?" asked her father.

"It's some woman who keeps saying long distance from Racine, Wis."

An elderly couple from the country approached one of the ticket windows at the railroad station. Obviously uneasy amidst big city surroundings, the little old lady asked:

"How much is the fare to Waynesville?"

"That's $4.65, ma'am," replied the clerk.

"Well, papa," she said, turning to the old gentlemen beside her, "we might as well buy the tickets here. I've asked at all these windows and they all charge the same."

Sam came into the office and was in terrible shape. His head was cut and bruised and bleeding.

"Sam, what on earth happened to you?" a co-worker asked.

"Oh, my girl friend and I had a big fight and I called her a two-bit street walker. She hit me over the head with a sack of quarters."

Boy: "In the old days did the knights fight with battle-axes?"

Father: "Well, the married ones did."

FREE WIRE ROPE RECOMMENDATIONS TO HELP YOU SAVE MONEY

Prepared by Experts, Booklets Give Specialized Wire Rope Uses in 5 Fields

What do you do when you have to decide what rope to order? Do you rely on your memory or look up the last order?

Here's an easy way to get the right answers *fast.* Refer to the Wire Rope Recommendation Booklet prepared by HAZARD engineers as a result of years of work in the field with every kind of machine that calls for wire rope. There's a different booklet for each of five basic industries—general contracting, industrial, mining, logging and marine. We'd like you to have these booklets for quick reference because they'll save you time and money by giving you the right answer of the right rope to use for any job in your field.

Written in clear, non-technical language, these new booklets are from 8 to 24 pages long. In addition to detailed wire rope recommendations for your own field, there is a page of LAY-SET wire rope characteristics which explains fully the basic terms of diameter, construction, lay, grade and core . . . all necessary in understanding wire rope nomenclature. Many action pictures of equipment at work also help to show the reader how recommended wire ropes are actually used on the job.

Send today for copies of any or all of the 5 free Wire Rope Recommendation Booklets. Simply check the booklets you would like to receive, in the coupon provided.

HAZARD WIRE ROPE DIVISION, Wilkes-Barre, Pennsylvania

Please forward the material checked below:

☐ Marine Services • DH-129-C ☐ Logging Operations • DH-129-E
☐ Industrial Services • DH-129-D ☐ Mining Industries • DH-129-A
☐ General Contractors • DH-129-B

Name _____

Title _____

Company _____

Address _____

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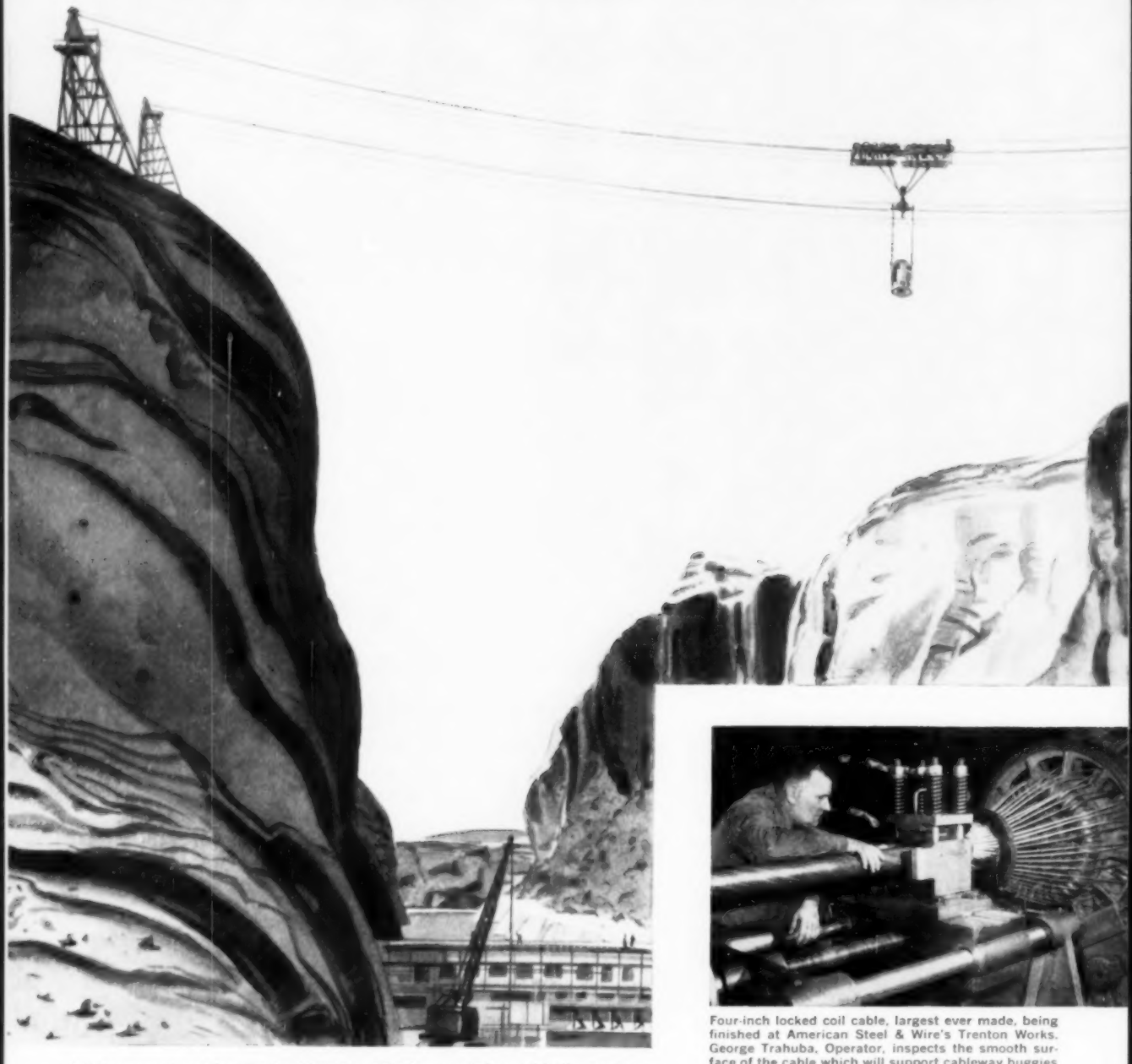
Superhighways in the sky



Artist's conception of how the two Tiger Brand Cableways will be used in the construction of Glen Canyon Dam on the upper Colorado River. The higher cableway can pass over the lower one. Both can service all areas of the construction site.

GLEN CANYON DAM

700 FEET HIGH—1400 FEET LONG

Second highest dam in the United States, located on the Colorado River in northeastern Arizona.

Ranks with the greatest dam projects ever undertaken and is a key feature of the U. S. Bureau of Reclamation's $400-million Colorado River Storage Project.

- Reservoir capacity—28,040,000 acre feet with a lake 186 miles long.
- Power capacity—900,000 kw. in eight generators.
- Volume of concrete in dam proper—4,770,000 cu. yd.
- Contract for dam and power house—$108 million, awarded to Merritt Chapman & Scott Corp.
- Cableway contractor: Kiewit-Judson Pacific Murphy Co.

Four-inch locked coil cable, largest ever made, being finished at American Steel & Wire's Trenton Works. George Trahuba, Operator, inspects the smooth surface of the cable which will support cableway buggies capable of handling 50 tons of construction material.

Perplexed porcupine, "Sticky," inspects short "broomed-out" length of the main cable made up of 312 steel wires. Over 145 tons of the cable have been made for the new dam's cableways.

Glen Canyon cableways . . . largest ever made!

MEN LOOK like midgets against the backdrop of Glen Canyon—but they are building a giant-size dam on the Colorado that will make a lake 186 miles long.

Glen Canyon will be the country's second highest dam. Its 700-foot height is topped only by the 726-foot Hoover Dam. It will require 4,770,000 cu. yds. of concrete which will be poured from two 50-ton-capacity cableways using 12-cu.-yd. buckets. This looks like an endless job, but these cableways really make speed. The contractor is aiming for an unprecedented rate of 9,000 cu. yd. daily—50% more than has previously been possible.

The track cable, or "main gut" as it is called by the dam builders, is the largest ever built. It is a 4-inch-diameter USS Tiger Brand Locked Coil Cable built at the Trenton, N. J., plant of American Steel & Wire. It has a strength of 880 tons, weighs 38 pounds per foot, and operates at a tension of 640,000 pounds. Tiger Brand operating ropes of 1½-inch diameter will also be used on this equipment to safely convey, raise and lower the loads into position.

At the dam, one of the two cableways stretches 2,050 feet between two traveling towers on opposite sides of the Colorado River. The second 1800-foot cableway connects two shorter towers allowing the higher span to pass over the top. Working together, the cableways can place 100-ton loads such as large steel penstock sections. They can handle work in any construction area at the dam.

Another Tiger Brand Cableway using a 3-inch cable 1,490 feet long is helping to build the Colorado River Bridge, the nation's highest and second longest steel arch span.

Tiger Brand Wire Rope is engineered to fit the job . . . engineered by one of the finest staffs in the country and backed by the basic research of the United States Steel Corporation. Next time you need wire rope, rig up with Tiger Brand. It will keep your machines on the job. Write American Steel & Wire, 614 Superior Avenue, N. W., Cleveland 13, Ohio.

USS and Tiger Brand are registered trademarks

American Steel & Wire Division of USS **United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors United States Steel Export Company, Distributors Abroad

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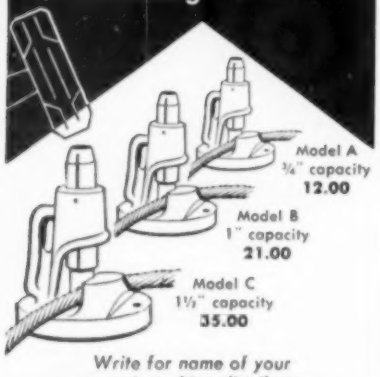

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WIRE ROPE CUTTER CO.

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New Trade Literature

Subject: **Welding Handbook**

Content: The American Welding Society has published Section II of the fourth edition of the Welding Handbook, Gas, Arc & Resistance Welding Processes. Section I dealt with the fundamentals of welding and was published in September 1957. The Welding Handbook, long regarded as the "bible" of the welding industry, has been divided into five sections, and one section will be published each year. When the five-volume edition has been completed, Section I will be revised again. As a result of this new concept in handbook publishing, up-to-date information on welding will be available each year. Section II contains thirteen chapters, each with a comprehensive bibliography and each with its own table of contents. Processes of a similar nature are grouped together and followed by a chapter describing the various types of equipment and accessories available.

Where to get: American Welding Society, Department EE, 33 W. 39th St., New York 18, N. Y.

Subject: **Pile Hammers**

Content: A 20-page bulletin tells how to select and use single-acting pile hammers. Vulcan hammers, using steam or air, are available in models with rated striking energy from 7,260 to 30,225 foot-pounds. The bulletin is comprehensive and deals with many subjects such as rating of hammers; selecting size required; safe bearing load for piles; and bases, plates, driving heads, helmets and head blocks. Ask for bulletin No. 68-F.

Where to get: Vulcan Iron Works, Department EE, 327 N. Bell Ave., Chicago 12, Ill.

Subject: **Swage Press**

Content: An 8-page catalog explains the new Esco 500-ton swaging press, its capabilities and applications. The last two pages are devoted to Esco stainless steel sleeves used in wire rope rigging. The 500-ton swaging press replaces the hand splice method with faster, safer wire rope fittings at lower cost. It occupies an area only four feet square, is compact and of single unit construction. The catalog shows the functioning of the swage press by cut-away drawings and the press in operation. Photographs of sleeves which have been swaged on wire rope illustrate the "flow" of metal obtained by the tremendous pressures exerted by the press. Ask for catalog 208A.

Where to get: Electric Steel Foundry Co., Department EE, 2141 N. W. 25th Ave., Portland 10, Ore.

Subject: **Backhoe-Loader**

Content: The 42-hp Case utility model 310B wheel-mounted backhoe-loader is described in an 8-page bulletin. The booklet presents 35 operating features of the "matched" trenching-loading machine, plus pertinent mechanical details of the Case-built backhoe, loader and heavy-duty tractor. Ask for bulletin CUS-110.

Where to get: J. I. Case Co., Department EE, Racine, Wis.

Subject: **Pit, Quarry Tractors**

Content: *Breaking The Barriers to Profit* is a Cat booklet designed to aid in machinery selection for the sand and stone industries. Containing on-the-job photos of Caterpillar-built machinery at work throughout the country, the booklet shows how modern earthmoving equipment handles the many production tasks around the pit site. Not only crawler tractors and bulldozers are covered but rippers, Traxcavators with side-dumping buckets, motor graders and rubber-tired scrapers as well. Size ratings for various haul units produced by Caterpillar are listed in the booklet. Ask for form D850.

Where to get: Advertising Div., Department EE, Caterpillar Tractor Co., Peoria, Ill.

Subject: **III Scrapers**

Content: Operating features of the International 75 Payscraper and the smaller model 55 are detailed in a 16-page catalog. The model 75 has a 20-yd. heaped capacity and is powered by a 262-hp turbocharged diesel engine. The heaped capacity of the model 55 is 14 cubic yards, and the machine is equipped with a 175-hp diesel engine. Features of the power train and bowl design are illustrated. Ask for catalog CR-733-H.

Where to get: International Harvester Co., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

Subject: **Wheel Accessories**

Content: A 94-page multi-purpose catalog contains pictures, information and engineering data on Goodyear rims, wheels, tools and rim accessories. Text includes information and pictures on rim research, step by step procedure for mounting and demounting rims, and operating instructions for using hydraulic tools. A complete list of Goodyear's rim distributors is included.

Where to get: Metal Products Div., Department EE, Goodyear Tire & Rubber Co., Akron 16, Ohio.

Subject: **Truck Crane**

Content: A 12-page catalog describes the Lorain model 107, a 7 to 8-ton truck-mounted crane, convertible to shovel, dragline, clamshell or hoe. The model 107 is a superstructure which is available for mounting on commercial carriers. Hydraulic controls, use of anti-friction bearings, boom lowering device and the tubular-chord crane boom are described in the catalog.

Where to get: Thew Shovel Co., Department EE, Lorain, Ohio.

Making Mighty Dams From Rugged Granite Mountains

Construction of a series of power company dams in North Carolina required excavation in several granite mountains. This 4-yard Marion 111-M shovel produced a big daily output even in the most difficult digging—making it a logical companion for today's big haulage units.

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MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

A Division of Universal Marion Corporation

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number. If blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

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650-B Bucyrus-Erie Elec. Drag, 195', 16-yd.
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9-W Bucyrus-Erie Diesel Drag, 165', 13-yd.
7400 Marion Diesel Drag, 175', 13-yd.
625 Page Diesel Drag, 150', 10-yd.
723 Page Diesel Drag, 130', 10-yd.
360-M Marion Elec. Drag, 178', 8-yd.
621-S Page Diesel Drag, 125', 7-yd.
200-W Bucyrus-Erie Diesel Drag, 125', 6-yd.
5-W Bucyrus-Erie Diesel Drag, 100', 6-yd.
2400 Lima Dragline, 130', 5-yd.
4300 Manitowoc Drag, 120', 5-yd.
120-B Bucyrus-Erie Elec. Drag, 115', 5-yd.
3900, 1500 & 3000 Manitowoc Cranes
111-M Marion Drag, 100', 4-yd.
1055 P&H Drag, 80', 3½-yd.
1201 Lima Dragline, 85', 3-yd.
54-B Bucyrus-Erie Drag, 80', 2½-yd.
5360 Marion 26-yd Elec. Shovel
730-B Bucyrus-Erie 20-yd. Elec. Shovel
1050-B Bucyrus-Erie 20-yd. Elec. Shovel
5480 Marion 18-yd. Elec. H. L. Shovel
151-M Marion 7-yd. Elec. Shovel
170-B Bucyrus-Erie 6½-yd. Elec. Shovel
4161 Marion 6-yd. Elec. Shovel
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54-B Bucyrus-Erie 2½-yd. Standard Shovel
Large selection of smaller Shovels and Draglines available
Model T-750 Reich Truck Mounted Rotary and Down-the-Hole Drill
Euclid Trucks—Rear and Bottom Dump
Truck Cranes, Dozers, Scrapers, Front End Loaders, Drills, Buckets, Attachments and other misc. equipment available.

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313 Hazleton Nat'l. Bank Bldg.
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SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Lorain model L50, 1-yd. capacity, 70-ft. boom, pendant suspension, fairleads, tagline, long and wide tracks.
$14,000 F.O.B. Elizabethtown, Ky.

Koehring model 304, ¾-yd. backhoe, crawler mounted, with IHC model UD14 diesel engine. $10,500 F.O.B. Elizabethtown, Ky.

Bucyrus-Erie model 22-B shovel with GMC diesel engine with torque converter, 26-in. wide treads. $23,500 F.O.B. Louisville, Ky.

BRANDEIS MACHINERY & SUPPLY CO.
Write—Wire or Phone
Jim Waddell
P. O. Box 1705 **Louisville 1, Ky.**
MElrose 7-4711

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

Michigan model C-24 ¾-yd. backhoe, 45-ft. crane boom, fairleads, Serial #4005, Hercules gas engine, extended crawlers.
Very good condition $10,500

Lorain model TL25, Serial #19697, ¾-yd. comb. backhoe and shovel, Waukesha gas engine, standard crawlers, 22-in. treads. Reconditioned.

Insley crawler mounted backhoe, type "K", 24-in. bucket, standard crawlers, Serial #6923, Waukesha gas engine, year 1955.
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Link-Belt model LS-51½-yd. comb. shovel and backhoe, standard crawlers, 20-in. treads, Waukesha gas engine, Speedomatic controls, Serial #6626. Very good condition $6,500

Bucyrus-Erie model 15-B ½-yd. cambered boom backhoe. Serial #112789, Cat D315 diesel engine, standard crawlers, 20-in. treads. Year 1955. Excellent condition.

Koehring model 405, 1-yd. shovel, Serial #9111, standard crawlers, Cat D318 diesel engine.
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CHAPMAN BINDER MACHINERY CO.
Brighton Street, Union, N. J.
MUrdock 8-0060

Lima Model 1201 shovel, serial #3339-10, with 52-ft. 6-in. boom, 22-ft. dipper handle, 3½-cu. yd. Amsco dipper, Cummins diesel, 2-KW Kohler light plant. Available about Jan. 1, 1959. Price F.O.B. cars Ely, Nev. Price: $80,000. For additional information please contact:

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 **Salt Lake City, Utah**
Phone: Davis 2-1241

⅜-yd. Model 10-B Bucyrus-Erie shovel (1949) good working condition. Available immediately.
¾-yd. Model H-3 Bucyrus-Erie Hydrocrane (1951) mounted on I.H.C. truck chassis, equipped with operator's cab, tagline reel, clamshell bucket. Very good condition.
¾-yd. Model 375 American crawler shovel with Waukesha gas power (new 1949). Can go right to work. $3,500
¾-yd. Model 255A P&H crawler dragline, equipped with fairlead, 35-ft. boom, Cummins diesel engine. Priced to sell.
1-yd. Model LS-90 Link-Belt shovel (new 1953), Waukesha gas power. Excellent condition. For sale or for rent.
1-yd. Model 455 P&H crawler crane-clam-dragline with 75-ft. boom, 15-ft. jib, Chrysler 8-cyl. gas engine. Entire machine in excellent condition. F.O.B. Milwaukee, Wis.
1¼-yd. Model 33-B Bucyrus-Erie crane-clam-dragline machine, 70-ft. boom, independent boom hoist, gas power, in very good condition. A lot of machinery for $16,500.
1½-yd. Model 604 Lima crane-dragline machine (1951) with Cummins diesel engine, 80-ft. boom and fairlead. Was overhauled last winter, very good condition. Price $27,500
2-yd. Model 820 Lorain crane-clam-dragline combination with Cat D13000 diesel engine, swamp cats, 110-ft. flange type boom, fairlead, pressure lubrication system; in excellent condition.
3-yd. Model 1201 Lima crane-dragline machine (1950) with Buda diesel engine, long wide crawlers, 110-ft. boom. In good condition. Priced to sell under $38,000.

CRANES FOR RENT

3-yd. Model 71-B Bucyrus-Erie dragline.
2-yd. Model 820 Lorain crane-clam-dragline.
1½-yd. Model 604 Lima crane-clam-dragline.

J. P. WAITE, INC.
3304 W. Pierce St. **P. O. Box 313**
Milwaukee 1, Wis. **EVergreen 4-1900**

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

SHOVELS

LINK-BELT Speeder Mod. LS90, 1-yd. capacity crane, 50-ft. boom, two sheave boom-point, 24-in. pads, Cat D318 diesel engine.
Reconditioned $12,500
LIMA Mod. 34 Paymaster, ¾-yd. Crane, 35-ft. boom, GM diesel engine. As inspected ..$9,500
BUCYRUS-ERIE 38-B Shovel, 20-ft. 5-in. dipper stick, 1¾-cu. yd. dipper, powered by International diesel engine. Rebuilt $38,500

SHOVEL ATTACHMENT

BUCYRUS-ERIE Tunnel Shovel attachment for 22-B consisting of 14-ft. boom, 12-ft. 10-in. stick, 1-cu. yd. rock dipper, crowd drum, sprocket and crowd chain.
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P&H Mod. 255A Backhoe ¾-yd. 26-in. tracks, powered by diesel engine.
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TRUCK CRANE

LIMA 44T Truck Crane, 25-ton combination clamshell and lifting Crane, 80-ft. boom, 30-ft. jib, Rudomatic tagline, Dart carrier, 9-ft. wide, Waukesha engines. Very good condition, 30-day guarantee $30,000

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CATERPILLAR Mod. DW21 tractor with Cat No. 21 scraper. Certified Buy. 2 units each.
.....$25,500
BUCYRUS-ERIE Mod. B-170 Scraper (18¾-yd. cap.) with 21:00 x 25 20-ply tires all around. Excellent condition $7,500
(4) LE TOURNEAU Mod. LS, 4-wheel scrapers. (11-yd. cap.). Excellent condition.
Each $4,500

TRACTORS

INTERNATIONAL TD-24 diesel tractor with crankcase guard, 24-in. tracks, pull hook, elec. starter, canopy top, bulldozer blade and D.D. P.C.U. Good operating condition $12,000
ALLIS-CHALMERS HD-20H diesel tractor w/ Garwood bulldozer and D.D. P.C.U.
Operating condition $12,500
CATERPILLAR D8 diesel tractor with oil clutch, 24-in. tracks, pull hook, canopy top and Cat 8S cable blade with Cat No. 25 D.D. P.C.U. Recent 13A series.
Bonded Buy $22,500

TRENCHER

CLEVELAND No. 95 Trencher, option 5, 16-in. buckets, 21½-in. cut, powered by Continental gasoline engine. Rebuilt. Good value $6,600

Subject to inspection & prior sale

H. O. PENN MACHINERY CO., INC.
140th St. & East River **CYpress 2-1800**
New York 54, N. Y.

P&H crane mounted on 12-wheel Maxi carrier, powered by Waukesha gas engine; 60-ft. boom. This machine is ideal for industrial application.

Allis-Chalmers HD-6G Tractomotive front end loader equipped with Tractomotive ripper model TR6 with two ripper shanks. This machine was new in 1957 and has had very good care.

4 (91-FDS) 18-ton Euclid rear dumps, equipped with quarry body, 2-yd. Top extensions and rock ejector bars. These machines are near new and have had only 500 to 700 hours' use.

39V Pioneer gravel plant GMC power 10-in. x 36-in. jaw crusher, 30-in. x 18-in. rolls, front end motor mount and conveyors. This is a good solid gravel plant.

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SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Marion 111-M dragline, 5-cu. yd. bucket, 80-ft. boom, #9520. New 1951, twin GMC diesel, electric swing; reconditioned, cleaned & painted. $62,500. Rental purchase, Indiana.

Koehring 1005, 2½-yd. shovel. Buda diesel. New 1948. $22,500. Rental purchase. Yard.

Bucyrus-Erie 22-B. Electric mine shovel. 1-cu. yd. New 1953. Rebuilt. $12,500. Yard.

Bucyrus-Erie 54-B dragline. New 1956.

Osgood 820 backhoe, shovel and dragline. 1½-cu. yd. New 1953. Government machine, used only 1,600 hours. Like new. Cat diesel D13000. Air controlled. Torque converter. High gantry. Bargain $24,000. Choice of attachment. Terms $1,000 per mo. Yard.

Shovel Attachments: For B-E 22-B new, $1,500; P&H 255-A new, $1,000; Unit 1020-A new, $1,250; Koehring #205 complete, good condition, $600; P&H 655-A good, $1,850. Yard. 1½-cu. yd. shovel buckets for P&H 655-A. $950. Yard.

Backhoe Attachments: For NW #25, $1,500; Marion 372 1¼-cu. yd. New, $4,500. Can fit other machines.

Crushers: Iowa 20-in. x 36-in. latest model, rebuilt. New bearings, shaft, jaws etc. $6,500. Yard. Iowa Super-Kock-It portable crushing & screening plant with 22 x 25 jaw, 30 x 33 Hammermill, 4-ft. x 10-ft. 2-deck screen, apron feeder. Twin GMC diesel tandem trucks. Rebuilt our shop. Guaranteed. $29,500. Consider rental purchase. Yard.

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FOR SALE OR RENT

Bucyrus-Erie, 71-B dragline (used 240 hours) 4½-cu. yd. new style bucket (B-E) Long wide crawlers, 42-in. treads, GMC Series 6-110 diesel engine, Clark Torcon torque converter, 70-ft. pendant suspended boom. Save. $15,000 or Rent.

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Milwaukee 1, Wis.

CLEARANCE SALE
PRICES HAVE BEEN REDUCED 5% to 25%

BUCYRUS-ERIE model 22-B ¾ yd. hoe, S/N 45148. Powered by UD-14 IHC diesel engine. Has been repaired & in good condition. Can furnish as a crowd shovel at same price. U-179 $13,600.

HANSEN model 31 shovel, backhoe, & dragline. S/N 2120. Has IHC UD-6 diesel engine. Condition is fair to poor. U-32 $3,500.

AUSTIN WESTERN BADGER shovel & backhoe, S/N 3386, powered by IHC UD-9 diesel engine. In fairly good operating condition. U-116 $3,750.

NORTHWEST model 25, ¾-yd. shovel, dragline, & hoe, 40-ft. crane boom & cambered type hoe boom, 30-in. track shoes, S/N 16806. This late 1955 machine is in excellent condition and guaranteed. U-130 $19,000.

NORTHWEST model 80-D, 2½-yd. shovel & dragline, including 60-ft. boom & bucket. S/N 12504. Murphy diesel engine has been completely rebuilt. Good condition & warranted. U-238 $26,500.

UNIT model 10-20, backhoe, crowd shovel, dragline, dragline bucket and clamshell bucket. S/N 1719. Good condition. U-249 $8,500.

YALE electric crane, model K 42-SH-6-7-78U, 6000# capacity, 12 to 18 telescopic revolving boom & hard rubber tires. It has never been used, but included in sale. Govt. surplus; unit sells new from factory for approximately $17,900. Our price less batteries & battery charger is only $3,950. U-81

BUCYRUS-ERIE crowd shovel attachment for model 15-B, ½-yd. excavator. Very good condition. U-40 $1,800.

BUCYRUS-ERIE crowd shovel attachment for models 20-B or 22-B ¾-yd. shovels. New & unused, but included in sale. U-201 $2,750.

NORTHWEST crowd shovel attachment for model 25, ¾-yd. New & unused. U-198 $2,250.

LINK-BELT 30-ft. dragline boom attachment including cable & fairlead. Excellent condition. U-242 $1,200.

SALE ends January 31, so call, wire or write today!

LANG CONSTRUCTION EQUIPMENT CO.

P. O. Box 1646 Salt Lake City, Utah
Phone: DAvis 2-1241 TWX No. SU-278

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—Michigan C-16, ½-cu. yd. backhoe, ½-yd. 22-in. bucket, 9-ft. 9-in. crawlers 20-in. wide. Hercules gas engine JXD #1742230, machine #3797, 4 years old.

1—Koehring 303, ¾-cu. yd. backhoe, 30-in. bucket, 10-ft. 6-in. crawlers, 24-in. wide. Waukesha gas engine #484150, 4¾-in. x 5¼-in., serial #2337.

1—Worthington 16-S Concrete Mixer on 4 pneumatic tires with power skip and water tank, serial #5548 powered by Wisconsin VF-4 gas engine, 4 years old.

1—Bucyrus-Erie H-3 Hydrocrane with telescopic boom and jib mounted on F-6 Ford truck with outriggers and clamshell bucket, serial #9309b.

1—Osgood 200, ½-yd. backhoe with 22-in. bucket, 11-ft. crawlers, 22-in. wide, powered by Continental gas engine, machine #6285, 5 years old.

1—International TD-14 crawler loader Model 14K3 with Drott skid-shovel, 2½-yd., serial #B-2463, only 1½ years old, excellent shape.

1—Bonded truck scale, 25 ton, 30-ft. x 10-ft. platform.

1—Bucyrus-Erie 15-B backhoe attachment with ½-yd. bucket, 34-in. wide with side cutters, straight boom, like new.

1—Bucyrus-Erie 15-B ½-yd. shovel attachment, perfect.

1—Owens heavy duty ¾-yd. digging bucket.

S. M. CHRISTHILF & SON, INC.
Timonium Road & Harrisburg Expressway
Timonium, Md.

SHOVELS

Link-Belt LS 85, ¾-yd. rock dipper. Cat D318 engine. Painted & reconditioned. Year end clearance. $7,950 f.o.b., St. Joseph, Mo.

CRANES

Link-Belt LS 50 crane-dragline. Cat D4400 engine. Painted & reconditioned. Very good operating condition. $3,950, f.o.b. St. Joseph, Mo.

Schield Bantam Crane. Only 3 years old. Mounted on factory late style carrier. Absolutely perfect condition. $9,750 f.o.b., St. Joseph, Mo.

Bucyrus-Erie 11-B demonstrator. Used only slightly. Any amount of boom or optional equipment. Large year end clearance price slash. Now at St. Joseph, Mo.

TRACTORS

Int. TD-24 with rear cable unit and dozer. Tracks 40". Painted & reconditioned. Transmission just rebuilt. Very good. Final clearance $5,950 f.o.b., St. Joseph, Mo.

AC TS-300 tractor-scrapers. Three. Fair to good rubber. Good operating condition. Owner will sacrifice. Call for information. St. Joseph, Mo.

AC HD-21 tractor with rear cable unit and dozer. Very late model in excellent condition. Excellent tracks. Call St. Joseph, Mo.

AC HD-11 tractor with AC hydraulic dozer. Very late model. One owner. Unusually clean. As is f.o.b., St. Joseph, Mo.

AC HD-6 hiloader. 1½-yd. bucket. Only 1650 actual hours. Very little wear. $9,500 f.o.b., Chillicothe, Mo.

ELECTRIC SET

Cat D4600 electric set. Excellent condition. $3,000 f.o.b., Chillicothe, Mo.

DRAGLINE BOOM

Bucyrus-Erie 15-B boom, 30-ft. $380. Chillicothe, Mo.

MIDLAND
Machinery Co.
Caterpillar Dealer

Chillicothe, Mo. St. Joseph, Mo.
PH: 280 PH: ADams 3-2516

Byers Dragline model 83, serial number 1700, with 35-ft. boom and 1-cu. yd. dragline bucket.

Unit No. C-13-605 Koehring, C6429, purchased new 1948, 50-ft. crane boom, two-point boom tip, heavy-duty fairlead. Cat 13000 engine, 150 hp. Serial number 457282.

Unit No. C-14, 605 Koehring, C6653, purchased new 1949, 50-ft. crane boom, two-point boom tip, heavy-duty fairlead. 6-71 GM diesel engine 185 hp. Serial number 165864.

Unit No. C-27, model 95 Northwest, purchased new 1950, Serial number 13389, 60-ft. crane boom, heavy-duty fairlead, model 21 Murphy diesel engine 185 hp. Serial number 14646.

Unit No. C-35, 1005 Koehring C8540, purchased new 1953, 40-ft. shovel front on machine, 50-ft. shovel front spare, 2½-yd. Amsco insert type bucket, D364 Cat V8 diesel engine. Serial number 19B219, 100 rpm, FL1210 HT-236 hp (194-254 Range) maximum counter weight, long wide crawlers.

Contact:
WOLVERINE TRACTOR & EQUIPMENT COMPANY

25900 W. 8-Mile Road Ph: KEnwood 4-8400
Detroit 19, Mich.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

1—705 P&H dragline, 2-yd. with 55-ft. boom.

1—Northwest model 25 crane with 45-ft. boom.

1—model H Scoopmobile, hydraulic loader, ¾-yd., 1955 model, excellent condition.

1—12-ton single axle trailer (7:50 x 20 tires New) air brakes new.

1—model C Scoopmobile 22-ft. tower, pallet fork or bucket, excellent condition.

1—model BB120 Wooldridge scraper, 14 to 18-yd., good.

1—model 41 Lorain ¾-yd. shovel with Cat D4600 engine, 1945 model. Needs some repair.

2—365 Gardner-Denver compressors—good.

1—model 10-20 Unit crane mounted on Dart truck, excellent.

1—1½-yd. Kiesler clamshell-rehandling.

1—¾-yd. Esco orange peel bucket.

1—HD-20 Allis-Chalmers with Cat 25, DDPCU.

1—Model 300 International Utility Tractor with Wain-Roy backhoe, 1956 models, excellent.

CONTRACTORS SUPPLY

620 East 18th St. Kansas City, Mo.

MISCELLANEOUS EQUIPMENT

CATERPILLAR MODEL D8 DIESEL TRACTOR, Serial 2U-10289, equipped with Caterpillar model 8U Bulldozer, Caterpillar model 25 rear-mounted double drum cable control unit, electric starting, crankcase guard, dry type air cleaner, 22-in. grouser tracks. $8,000.

CATERPILLAR MODEL D8 DIESEL TRACTOR, Serial 2U-20642, equipped with Caterpillar model 8-S straight blade bulldozer, Caterpillar model 25 rear-mounted double drum cable control unit, crankcase guard, electric starting. Machine is in poor to fair condition. $6,000.

CATERPILLAR MODEL D7 DIESEL TRACTOR, Serial 3T-7402, equipped with Le Tourneau angle blade bulldozer, Gar Wood CCU-2 rear-mounted double drum cable control unit, Serial No. 22766, roller guards, large front idlers, seven roller track frame. Good condition. $8,500.

INTERNATIONAL MODEL W-9 WHEEL TRACTOR, Serial No. WCB-57639W12B, powered by 47-hp gasoline engine, equipped with two 7:50 x 18 front tires, two 14:00 x 34 rear tires with wheel weights, electric starting, swinging drawbar, rear power take-off. Very good condition. $2,500.

HYSTER MODEL CG GRID ROLLER, Serial No. 100717, equipped with racks for concrete counterweights, inside cleaners, towing tongue with universal hitch, retractable jackleg and tool box. This roller is in very good condition. $5,900.

LE TOURNEAU MODEL G6 CABLE OPERATED SCRAPER, Serial No. 45-65, 6-cu. yd. capacity equipped with 10:00 x 20, 12-ply tires, front & rear. Fair condition. $1,000.

CATERPILLAR MODEL D6, 74-IN. DIESEL TRACTOR, Serial 9U-321, equipped with 6-roller non-oscillating track frame, large front idlers, 16" wide grouser tracks, Caterpillar model 46 front-mounted hydraulic control unit, Trackson model AF-6 hydraulic angling blade bulldozer, Trackson model MD-6 pipelayer, complete with 14-ft. boom and snatch block. Very good condition. $12,500.

HYSTER MODEL D8N TOWING WINCH, Serial HRN-21763, complete with controls for use with Caterpillar model D8 diesel tractor. Good condition. $1,500.

HYSTER MODEL D8N WORM DRIVE WINCH, Serial WHN-72592, complete with power take-off shaft, control levers, operator guard. Fair condition. $2,250.

CATERPILLAR MODEL 12 TANDEM DRIVE DIESEL MOTOR GRADER, Serial 8T-523, equipped with cab, heater, lights, electric starting, power steering, scarifier, 13:00 x 24 front and rear tires. This machine is in very good operating condition. $10,750.

BUCYRUS-ERIE MODEL 54-B SHOVEL & CRANE COMBINATION, Serial No. 77778, mounted on 30-in. standard flat pads, equipped with 80-ft. crane boom, 20-ft. jib shovel front with 26-ft. boom, 18-ft. handle, 2½-cu. yd. dipper, high gantry, running boards, counterweight, powered by Buda model 6DC-1879 diesel engine, Serial No. 36869-F with electric starting, also, has a Kohler light plant for electric lights. Very good condition. Located at Gallup, N. M. $45,000.

INGERSOLL-RAND MODEL D-85 TWO STAGE PORTABLE AIR COMPRESSOR, Serial 40-T-45930, powered by Waukesha model EAH 215-1 water cooled gasoline engine, Serial 908218, complete with electric starting, all mounted on two 6:00 x 16 pneumatic tires, with towing tongue. Good condition. $1,500.

R. L. HARRISON CO., INC.

1801 4th St., N.W. P. O. Box 1320
Phone: 7-8811 Albuquerque, N.M.

MISCELLANEOUS EQUIPMENT

FOR SALE

2—Bucyrus-Erie 54-B Ward-Leonard electric shovels, serial Nos. 19397 and 19398 with 2½-yd. dippers.
1—Bucyrus-Erie Model 27-T electric blast hole drill. Shop #23446 with 15-hp G.E. motor.

PICKANDS MATHER & CO.
Purchasing Dept. 700 Sellwood Bldg.
Duluth, Minn.

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(2) ¾-cu. yd. type AX medium duty dragline buckets complete with all fittings. Weight—950 lbs. Price $710 each. f.o.b. Evansville, Ind.

BUCYRUS-ERIE CO.
South Milwaukee, Wisconsin

22-W Two new unused IHC, U-164, 4-cylinder 5½ x 4½-in. closed gasoline power units.
48-L Two new unused Waukesha 6 WAKU, 6-cylinder 6¾ x 6½-in. natural gasoline power units.
1-W One rebuilt IHC, U-1, 4-cylinder 2⅝ x 2¾-in. closed gasoline power unit. Never operated after rebuilt.
Above engines offered as is f.o.b. South Milwaukee, Wis., subject to prior disposition. Will sacrifice for quick sale.

J. E. Smart
BUCYRUS-ERIE CO.
South Milwaukee, Wis.
Phone: SO 2-0900

ONE—2½-YD. COAL LOADING DIPPER, NEW FOR 38-B. LOCATED NEAR PITTSBURGH. $2500.
BOX 3720

PRICES HAVE BEEN REDUCED 5% to 25%
ADNUN Blacktop Paver, S/N 1462. Has been repaired & is in good operating condition. U-5 $2,100.
BARBER-GREENE model 879-A Finisher. Lays 8 to 12-ft. strip. Powered by LeRoi gas engine. Very good condition. U-244 $6,800.
BARBER-GREENE model 879-A asphalt finisher, S/N 49-67. Powered by LeRoi gas engine. Has been completely rebuilt & is in excellent condition. U-120 $9,200.
BARBER-GREENE model 840-B asphalt plant. Includes mixer, hot elevator, dryer, dust collector, tanks, piping, and 879-A finisher. Equipment is only 2 years old and in excellent condition. Immediately available. Only $29,500.
CARCO model "J" logging winch, 1953 model. Good as new. U-65 only $2,600.
CARCO model "G-4" logging winch, S/N 3844. Excellent condition. U-303 $1,700.
CEDARAPIDS 12 x 16 jaw crusher mounted on 2-axle trailer with 4 new tires. Has Case gasoline engine & truck height loading conveyor. Good condition. U-272 $4,500.
CLEVELAND wheel ditcher, "Babe Digger," S/N 306. Powered by Hercules gas engine. Has 4½-ft. digging depth. Fairly good working condition. U-1 $1,450.
LE TOURNEAU model C Tournadozer. Powered by Buda diesel engine. Has cab & cable control unit. Unit has been repaired & is in good operating condition. U-149 $3,950.
LE TOURNEAU "C" electric Tournapull scraper. Has 15-yd. capacity & tires that are like new. Powered by GMC 6-71 diesel engine. Excellent condition throughout. U-3 $15,500.
BUCYRUS-ERIE model S-90 tractor drawn scraper. Good condition. U-189 $3,100.
LE TOURNEAU 12-yd. tractor drawn scraper, Model LP. Good condition. U-271 $3,750.
ALLEN cab for IHC TD-14A crawler tractor. $150.
SALE ends January 31, so call, wire or write today!

LANG CONSTRUCTION EQUIPMENT CO.
P. O. Box 1646 Salt Lake City, Utah
Phone: DAvis 2-1241 TWX No. SU-278

6-W Bucyrus-Monighan dragline 135-ft., 6-yd.
P&H 700 shovel, gas, 1¾-yd., 29-ft. boom.
655B P&H diesel dragline, 55-ft. 1½-yd. and new shovel front with 1½-yd. dipper.
255A P&H diesel ¾-yd. shovel.
4—Austin-Western 10-ton Trail cars with Hydraulic dump, with 5th wheels.
50-KW, GE 125-V DC generator direct-connected to 75-hp 220-V AC motor.
3—Link-Belt 36-in. rescreening loading booms.
Link-Belt shaker screen, 5-ft. wide, 38-ft. long.

McLAREN EQUIPMENT CO.
200½ W. Main St. Wyandott 3-5313
Marion, Ill.

MISCELLANEOUS EQUIPMENT

9-W ENGINE

New unused current model Cooper-Bessemer JS-6-D 13-in. x 16-in. diesel engine. Normally rated 705 hp @ 514 rpm. Will sacrifice. Contact J. E. Smart, Bucyrus-Erie Co., South Milwaukee, Wis., Phone: SO 2-0900.

3—New, unused, 3-cu. yd. type "BU", Bucyrus-Erie lightweight dragline buckets with all fittings. Weight—5,150 pounds each. Special reduced price—$1,935 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE CO.
South Milwaukee, Wis.

ATTACHMENTS

54-B dragline boom and fairleads.
22-B fairleads—unused.
22-B backhoe attachment.
22-B shovel attachment & crane boom.
15-B shovel attachment—unused.
Lima 34E shovel attach; chain & rope crowd.
P&H 955 fairleads.
N. W. 6 & L82 fairleads.
655 P&H unused backhoe attachment.
Many others on hand.
Season close out at special prices.

AIR COMPRESSOR RENTAL CO., INC.
19615 Nottingham Road Cleveland 10, Ohio

2—3-cu. yd. type "BM" medium duty, thoroughly reconditioned, dragline buckets complete with all fittings. Weight 4,800 pounds each. Special reduced price $2,350 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE CO.
Evansville, Ind.

1—New 4-cu. yd. type AX Bucyrus-Erie, medium duty dragline bucket with all fittings. Weight—9,100 lbs. Special reduced price $3,150. f.o.b. South Milwaukee, Wis.

BUCYRUS-ERIE CO.
South Milwaukee, Wis.

Sullivan Horizontal Drill. Good condition, drilling 6-in. hole. Walter Robertson, Harmon Creek Coal Corp., Florence Mine, Burgettstown, Pa.

1—New, unused, 20-cu. yd. type "BM" medium duty bare dragline bucket body with teeth. Weight 22,300 pounds. Special reduced price—$11,000 F.O.B. South Milwaukee, Wis. John T. Aspel, Bucyrus-Erie Co., South Milwaukee, Wis.

EQUIPMENT WANTED

Wanted—1 set short track frames for 71-B Bucyrus-Erie shovel. Write: L. G. Everist, Inc., Paulton Bldg., Sioux Falls, S. D.

Notes from the Manufacturers

Arcair Co., Lancaster, Ohio, has named Elmer Lehmkuhl as sales manager. He will be responsible for marketing and sales of all Arcair products in the company's eastern division. Other appointments include Martin Boyer to sales promotion and advertising manager and Durward B. Vaught to field representative in Virginia, Kentucky, and southern West Virginia.

Bay City Shovels, Inc., Bay City, Mich., has elected G. L. Sittser as executive vice president. Sittser, 45, has had broad experience in both the automotive and industrial fields.

Bucyrus-Erie Co., South Milwaukee, Wis., has a new Hydrocrane distributor in New England. Field Machinery Co., Cambridge, Mass., will sell and service 5 and 12-ton capacity Hydrocranes and ⅜ and ¼-yd. Hydrohoes and Hydroshovels. The distributor's territory includes the entire state of Rhode Island; the Massachusetts counties of Essex, Middlesex, Worcester, Suffolk, Norfolk, Plymouth, Barnstable, Nantucket, Dukes and Bristol; and New Hampshire counties of Balknap, Merrimack, Hillsborough, Cheshire, Strafford and Rockingham. Parts and servicing facilities are maintained at the distributor's plant, 300 Binney St., Cambridge.

Electric Steel Foundry Co., Portland, Ore., has named Hugh Redditt district representative in the Middle Atlantic states. He will work with ESCO construction and crushing equipment dealers in the states of New Jersey, Maryland, Delaware, Virginia and the eastern half of Pennsylvania. Before joining ESCO, Redditt sold heavy construction machinery and allied equipment in the Philadelphia (Pa.) metropolitan area.

Euclid Div., General Motors Corp., Cleveland, Ohio, has a new distributor in Florida. Square Deal Machinery Co., of Orlando, Jacksonville and Miami, has been assigned the entire state except the counties west of the Apalachicola River. T. M. Deal, Sr., is president of the company.

Gardner-Denver Co., Quincy, Ill., has appointed Spreitzer, Inc., Cedar Rapids, Iowa, and Peoria, Ill., distributor for Gardner-Denver construction and quarrying equipment in Iowa and Illinois. The new distributor is a 10-year old company begun by Harry J. Spreitzer, who has been in the construction machinery sales and service field for 25 years.

International Harvester Co., Chicago, Ill., has promoted Ralph A. Elliott, a 25-year IH veteran, to central region sales manager of the company's construction equipment division. Since 1956, Elliott has been assistant sales manager. The central region includes 16 states. Elliott succeeds William F. Hall, who became assistant divisional manager.

Here's a complete handbook on Wire Rope!

Here — in a compact book — is the information you can use to reduce your yearly rope costs. It's free to wire rope users . . . just ask for G16: Macwhyte's "Blue Book of Wire Rope."

This completely indexed, pocket-sized book lists rope sizes, strengths, weights, lays, sheave sizes, and materials, plus inspection and lubrication procedures.

Reach for Blue Book G16 any time you need wire rope information. And for cost-saving recommendations on the right rope to use for each type of service, ask for a Macwhyte representative to call.

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Manufacturers of Internally Lubricated PREformed Wire Rope; Braided Wire Rope Slings; Aircraft Cables and Assemblies; Monel Metal, Stainless Steel, Plastic-Coated and Nylon-Coated Wire Rope; and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: New York 4, 35 Water St. • **Pittsburgh 36,** P. O. Box 10916, 353 Curry Hollow Road • **Detroit 3,** 75 Oakman Blvd. • **Chicago 6,** 228 S. Desplaines St. • **St. Paul 14,** 2356 Hampden Ave. • **New Orleans 2,** 144 Thalia St. • **Ft. Worth 1,** P. O. Box 605 • **Portland 9,** 1603 N.W. 14th Ave. • **Seattle 4,** 87 Holgate St. • **San Francisco 7,** 188 King St. • **Los Angeles 33,** 185 S. Myers St.

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MACWHYTE WIRE ROPE

Wire Rope made for a purpose—to serve you better

2-yd Loader Averages 2,700 yd Per Day for 5 Months on 2½-Million-yd Borrow Job

JOB: Relocation of Route 5 from Longmeadow, Massachusetts, to state line of Connecticut. 2½ million yards of borrow. Started last summer.

REPORT: — "Everyone in the area, it seems, who owns a shovel and a couple of trucks, is hauling on this job," says an on-the-spot reporter.

"The center of attraction, though, is the 2-yd TL-20 TRACTOLOADER* owned by Enfield Road Construction Company, Enfield, Connecticut. It sure is building a reputation for itself.

"It fills a 12-yd truck every 3½ minutes. Averages 2,700 yd in a 10-hour day. It can be, and has been, pushed to 3,000 yd."

One of the reasons for this fast loading is Tractomotive's *exclusive* ONE-LEVER control of speed and direction. Operator goes into and out of any forward or reverse gear while moving—always works at highest possible speed.

Some of the other reasons for the TL-20's outstanding performance include: LONGER REACH — you dump loads right into center of high truck bodies. GREATER STABILITY — more operating comfort, less spillage. STRONG, PIN-CONNECTED AXLES — no rolling and shifting under load.

See how the TL-20 can increase your production. Your ALLIS-CHALMERS dealer will be glad to show you.

*TRACTOLOADER is a registered Tractomotive trademark.

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